ENVIRONMENTAL INJUSTICE AND POST-COLONIAL ENVIRONMENTALISM: OPENCAST COAL MINING, LANDSCAPE AND PLACE

Paul Milbourne (Cardiff University) and Kelvin Mason (Independent Researcher)

Abstract

In this article we use a case study of opencast coal mining in the southern valleys of Wales to explore the ordinary and everyday spatialities of environmental injustice. Responding to recent geographical critiques of environmental justice research and engaging with post-colonial studies of landscape and environment, we provide an account of environmental injustice that emphasises competing geographical imaginaries of landscape and 'ordinary political injustices' (Fraser, 2008) within everyday spaces. We begin with a discussion of how historical environmental injustices in Wales have been framed within nationalist politics as a form of colonial exploitation of the country's natural resources. We then make use of materials from recent research on opencast mining in south Wales to examine local understandings of and everyday encounters with mining, highlighting contradictory discourses of opencast mining, landscape and place, and the injustices associated with mining developments in this region.

1. Introduction: How Green *Is* My Valley

"Perhaps it was through looking at the other valley so long that I got such a worrying shock when I looked again at ours. All along the river, banks were showing scum from the colliery slump, and the buildings, all black and flat, were ugly to make a hurt in your chest…Our valley was going black, and the slag heap had grown so much it was half-way along to our house. Young I was and small I was, but young or small, I knew it was wrong, and I said so to my father." (Llewellyn, 1939, 47-8)

"We are greatly opposed to this proposal. Many of us remember the last opencast on our side of the mountain – the black specks of dust it brought to our houses and the clothes on the line. We remember the noise of the vehicles and the blasting that echoed across the valley. We love our mountain as it is now, green and beautiful." (Mary, resident of the Rhymney Valley, 2013)

In his novel *How Green Was My Valley*, Richard Llewellyn captures something of the environmental destruction resulting from the development of coal mining in the southern valleys of Wales in the early decades of the twentieth century. Within the extract provided above, Huw, the book's narrator, discusses the transformation of his everyday landscape from a natural to industrial space as the waste products of coal extraction quite literally turn his valley black. In doing this he also expresses a sense of regret and injustice about these changes. Huw's father responds to him by pointing to his own sadness about the 'ugliness and hate and foolishness' present in their valley, resulting from the mine owners' attitude of 'want all, take all, and give nothing' (48). His father argues for a more sustainable relationship with the land beneath them, commenting that '[y]ou will have everything from the ground if you will ask the right way. But you will have nothing if not' (48).

The southern valleys of Wales (hereafter the Valleys) were one of the core spaces for the industrialisation of the UK in the nineteenth century. The region contained large volumes of high quality coal and iron ore, which were used to

fuel economic growth in Wales, the UK and internationally. Coal mining had been a feature of the Valleys for several centuries but the discovery of significant quantities of steam coal in the mid-nineteenth century led to the rapid expansion of the region's coal industry. By 1854 the number of operating collieries totalled 198 in the historic counties of Glamorgan and Monmouthshire, rising to 408 in 1878, and in 1913 the coal industry produced 57 million tonnes of coal and employed 232,000 workers, one-quarter of the total workforce in the Valleys (BBC, 2008). From being a series of agricultural villages and small towns in the mid-nineteenth century, the Valleys became highly urbanised in only a small number of decades as large numbers of migrants moved to the area in search of work. The scale of this migration led to important political and cultural transformations, not only in the Valleys but, as Daniel Williams suggests, for Wales as a whole:

> "The shift from a pastoral country with its population fairly evenly spread throughout its regions into a predominantly industrial nation with its urban majority packed into the southern coalfield was accompanied by significant cultural shifts that were the making of modern Wales: geographically from country to city; politically from Liberal to Labour; linguistically from Welsh to English." (2008, xxxii)

Coal mining also reshaped the physical landscape of the Valleys. Echoing Huw's father's comments, the mine owners approached the land as a commodity to be exploited, with little respect given to the existing natural features of the landscape. Valley bottoms and sides were ruthlessly excavated and the waste products of this mining activity dumped in any available spaces, which were few and far between in the narrow valleys. The landscape very much took on a scarred feel with existing mountains despoiled and new ones created in the form of waste tips. Local woodlands were also ravaged in an effort to supply timber to support the mine shafts. The dumping of waste mining products in tips was not only ugly on the eye but also fraught with danger, with frequent slippages taking place. The most devastating of these occurred on 21st October 1966 when a waste tip above the village of Aberfan became unstable

and engulfed a primary school and a number of houses, killing 144 people, including 116 children.

The inter-war years witnessed a fall in demand for coal from the Valleys as the expansion of coal extraction in other countries increased global competition, oil became the preferred fuel for the shipping industry, and the lack of investment in the mechanisation of mining in the region made it less efficient than its competitors. Employment in the mining sector declined dramatically during this period. For example, in the town of Merthyr Tydfil, located in the upper parts of the Valleys, the number of working miners fell from 24,000 in 1913 to 8,000 in 1934. While the Second World War temporarily increased domestic demand for coal, the decline of mining in South Wales continued in the post-war period, with the number of miners employed in the region falling from 125,000 in 1945 to 22,000 in the early 1980s and less than 1,000 ten years later. Tower Colliery, the last deep mine in the Valleys (and Wales), closed in 2008[1].

The demise of coal mining in the Valleys resulted in a series of state-sponsored interventions to regenerate the region. The *Regional Selective Assistance* programme, established in the 1930s by the UK Government to aid those places reliant on declining industries, provided significant funding to the Valleys to attract new economic investment in the inter- and immediate post-war period. In more recent decades the Welsh Office and, following devolution, the Welsh Government have developed various initiatives to revitalise the Valleys, mainly focused on attracting new forms of employment. From the 1980s onwards a more holistic approach to regeneration policy can be identified; one that seeks to balance economic, social and environmental interventions. Indeed, environmental improvement has been viewed by government and regeneration agencies as crucial in attracting new economic investment to the Valleys. The current regeneration strategy for the upper parts of the region continues this holistic approach with its focus on economic investment, education and training, tourism, connectivity and environment (Adamson et al., 2014).

---

[1] This mine was actually closed in 1994 but a workers' buy-out in 1995 enabled the mine to remain operational for a further 13 years.

These efforts to regenerate the Valleys in ways that balance economic, social and environmental considerations have been complicated in recent years by an increase in opencast coal mining[2] activity in the region. Appearing to contradict Welsh (and UK) policy discourse on low carbon futures, opencast mining has been justified – in policy and planning terms - in relation to short-term energy demands and the restoration of sites of previous deep mining activity. However, as Mary comments, communities living alongside proposed opencast sites see the return of mining in somewhat different terms: as blackening once again their 'green and beautiful' landscape. Her words suggest a collective memory of the inconveniences and injustices of past rounds of mining activity as well as a desire to move towards a greener, post-mining future. A strong emotional attachment to the local landscape is also evident, with Mary making reference to 'our' mountain in a way that indicates cultural connections with this space and the significance of nature to the community's post-mining identity.

Our aim in this article is to explore these contradictory discourses surrounding opencast mining in the Valleys. Drawing on research materials from interviews with a mining company, members of anti-opencast campaign groups, local councillors and communities living alongside a couple of mines, we examine understandings and experiences of mining in the context of local landscape and place. The article is structured around three sections. We begin by framing our empirical study within recent scholarship on environmental injustice, paying particular attention to work on local, everyday and mundane forms of environmental injustice as well as emerging post-colonial writings that have sought to engage with landscape and environment as a form of alternity. Second, we provide a brief discussion of how historical environmental injustices in Wales came to be constructed within nationalist politics as a form of colonial exploitation of the country's natural resources. Finally, we investigate sets of contemporary environmental injustices associated with opencast mining activities in the Valleys, focusing on 'ordinary political injustices' (Fraser, 2008) and competing geographical imaginaries of mining, landscape and place.

---

[2] Opencast mining is also referred to as surface mining.

6

2. Unjust environments: capitalist nature, environmental injustice and post-colonial environmentalism

Over the last two or three decades geographical scholarship on the political economy of nature has done much to highlight the ways in which the environment is categorised, appropriated and exploited in commodity terms by capital (Castree and Braun, 2001; Fitzsimmons, 1989; Harvey, 1996; Heynen et al., 2007; Smith, 1984). This notion of capitalist or 'second' nature (Smith, 1984) suggests that environments and landscapes are largely or exclusively valued in relation to their actual or potential contributions to the means of production and the generation of economic or financial profit. Research has examined the operations of different natural resource industries, associated with food, energy, timber and water production, demonstrating how they develop and then impose new sets of productivist nature – society relations on space, often overriding established meanings of nature amongst local (and indigenous) communities, and adopting strategies to overcome challenges from groups that oppose their activities (see Bridge and Le Billon, 2012; Milbourne et al., 2008; Morrone and Buckley, 2011; Pudham, 2004; Swyngedouw, 2004).

The relations between injustice and environment have been approached in more explicit terms through work in urban political ecology. Here important efforts have been made to politicise discourses of sustainability and to import the environment into debates about urban power relations and inequalities. Within urban political ecology, cities are viewed as being produced and reproduced through hybrid socio-ecological processes. What follows from this is that urban injustices are generated by and experienced through the complex interplay between economic, socio-cultural, political <u>and</u> environmental processes. For Heynen et al. (2006), urban political ecology opens up new sets of questions for urban researchers concerning 'who (or what) gains from and who pays for, who benefits from and who suffers (and in what ways) from particular processes of metabolic circulatory change' (p. 12). Similarly, place-based research on urban poverty has demonstrated the significance of the

environment in relation to people's experiences of poverty and sense of place, with the absence or neglect of local green spaces compounding senses of marginalisation and disadvantage (see Burningham and Thrush, 2001; Milbourne, 2012).

Perhaps the most overt discussion of the interactions between injustice and the environment has emerged from work on environmental justice. Early academic studies largely followed the environmental justice movement in the US, describing its political development and its potential translation to other Global North countries. Attention was given to the uneven distribution of environmental 'goods' and 'bads' across society and space, highlighting how dirty industries, toxic wastes and other sources of pollution had a disproportionate impact on disadvantaged communities, and particularly those containing concentrations of minority ethnic groups (see Agyeman and Evans, 2004). More recent scholarship on environmental justice has been more critical of previous approaches to justice and space. In relation to the first of these, efforts have been made to move beyond distributional forms of environmental justice to engage with other ideas of justice, most notably those concerning participation and recognition (see Schlosberg, 2007). In particular, research has focused on the lack of representation and recognition given to certain issues, groups and spaces within debates on and campaigns against environmental injustices (Williams and Mawdsley, 2006). In doing this, important connections have been made with justice work in political philosophy, particularly Fraser's (2008) accounts of 'ordinary political injustices' that arise 'when skewed decision rules compromise the political voice of some who are already counted as members, impairing their ability to participate as peers in social interaction'.

Turning to the spatialities of environmental justice, Walker (2012) argues that understandings of environmental injustice remain sensitive to the specificities of space and place, and that geographical meanings shape environmental justice discourse:

> "If the spaces that matter are…those of place identity, community,
> process and procedure, or if the meanings and values given to social

and environmental spaces are socio-culturally rather than statistically defined, then we should expect both the meaning and spatiality of environmental justice to shift and reform as the framing travels and translates" (630-1).

Others have called for a scaling down of environmental justice research. Hobson (2006), for example, criticises environmental justice scholarship for its neglect of the 'struggles for environmental justice manifest in the daily practices of individuals and organizations' (671). She argues not only that these struggles are 'far from being too mundane to be politically significant' but that they also offer 'detailed insights into how particular injustices become apparent through the use and control of space' (ibid., 671). Similarly, Whitehead (2009), in a study of urban community forests, suggests that a focus on everyday space provides a 'new way of beginning to imagine ordinary forms of [environmental] justice' and developing different 'frameworks of action to investigate banal forms of disadvantage' (669). More particularly, he calls for further work on the 'remaindered spaces' of environmental injustice – those everyday spaces that fall between the responsibilities of the state and other organisations. Furthermore, recent research on urban community gardening highlights how the everyday, mundane and remaindered environments of disadvantaged urban neighbourhoods shape people's understandings and experiences of, as well as their responses to, environmental injustices (see Milbourne, 2012; Nettle, 2014).

New approaches to environmental injustices also emerge from recent engagements between post-colonialism, environmental studies and geography. Said's (1978, 2000) seminal writings on the 'imaginary geographies' of colonial landscapes have been influential here in demonstrating how powerful groups reinvent meanings of landscape in order to exert control over people and place (see also Schama, 1995). Through this process new discourses are produced 'justifying why they [the powerful] are entitled to take control of the place being invented' (Fields, 2011), with the exercise of power over space recasting the social and physical features of landscape to reflect the imagined vision. For Said (1978) and others, landscape thus represents a non-human witness to

social, economic and political forms of violence associated with colonialism, with the traumas of the past able to be read through the contours of the contemporary landscape. A key task for postcolonialist scholars then is to approach landscape as an 'ongoing spatial history in which dominant groups and subalterns confront one another in an effort to reimpose and defend competing visions of life on the land' (Fields, 2011, 21).

Just as we can read 'histories of colonial violence embedded in the earth' (Deloughrey and Handley, 2011), so it is possible to view other, more recent forms of exploitation – associated in particular with globalisation and neo-liberalism – as involving struggles surrounding the control over and meanings attached to landscape. In doing this, important questions are raised about who can, or is entitled to speak for landscape, environment and nature (Deloughrey and Handley, 2011). Egoz et al. (2011) frame these questions within a broader context of the 'right to landscape', connecting landscape contestations with wider debates surrounding socio-spatial justice and critiques of the neoliberalisation of nature (see also Olwig and Mitchell, 2009). They argue for the development of more grounded and vernacular readings of landscape as both a product and process of people shaping their immediate and everyday environments, and 'making sense of the world through shared meanings and values' (ibid., 4; see also Williams, 1958). This resonates with Olwig's (2011) view of landscape as a space that emerges from everyday practice rather than external definition: a 'place of a habitus, the rights to which devolve to those who use it in a way judged to be moral by the communities who share it' (17).

These attempts to identify alternative and everyday meanings of landscape connect with a key pillar of postcolonial geography scholarship, that of developing 'grounded genealogies of the uneven co-production of categories, sites and landscapes' (Sidaway et al., 2014); they also speak to recent engagements between postcolonial geography and environment/alism. For example, Jackson (2014) suggests that the environment represents not only a rich research area for postcolonial geographers but also a necessary one, with environmental challenges relating to climate change, resource depletion and energy scarcity combining with processes of displacement, inequality and

cultural marginalisation in many countries. Addressing these challenges, though, raises important questions about scale within post-colonial research, as global environmental problems place new demands on postcolonial geography to 'reach deeper than provincializing has thus far allowed to address our imprecise becoming within an ever hybridizing pluriverse' (Jackson, 2014). Whereas postcolonialism scholarship tends to emphasise 'tensions and disruptions between local and global frameworks of experience' (Buell et al., 2011, 422), global environmental challenges complicate the binaries of global / local and totality / difference (Jackson, 2014). As Deloughrey and Handley (2011) argue in relation to climate change mitigation, 'global climate justice asks us how to move toward radical corrective measure while maintaining the delicate balance between global and local difference' (25).

3. Past environmental injustices in Wales: colonial perspectives

Colonial framings of environmental injustice have a long history in Wales. Indeed, it is claimed that the exploitation of natural resources in the country was a significant shaper of nationalistic politics in the second half of the twentieth century. In his book *Fighting for Wales*, Gwynfor Evans (1991), Plaid Cymru's[3] first MP, discusses various attempts by the UK Government to exploit the land of Wales. He highlights the Forestry Commission's plan in 1950 to impose industrial forests across 1.25 million acres of land in rural Wales without any form of consultation with local communities or their elected representatives. In the same year, Evans reports that the Electricity Board announced its intention to develop a large hydro-electric scheme in north Wales 'which would have ravaged some of the most enchantingly beautiful countryside in Wales and caused widespread agricultural injury' (73). Opposition campaigns highlighting the cultural significance of these landscapes, the injustices of land clearances and the disempowerment of Wales within political decision-making in the UK, were successful in resisting these projects.

---

[3] Translated as the Party of Wales, Plaid Cymru is the main nationalist political party in Wales, with two elected representatives in the UK Parliament and 11 in the National Assembly for Wales.

The most contentious exploitation of natural resources involved the flooding of valleys in rural Wales to supply water for cities in England. Several communities in mid-Wales had been displaced in the late nineteenth century as their villages were destroyed and valleys flooded to provide water for Liverpool and Birmingham. The proposed flooding of the Treweryn Valley in rural Wales in the early 1960s to supply water to Liverpool and surrounding areas attracted considerable opposition not only from the local community but also from Plaid Cymru and Welsh MPs in the UK Parliament. Opponents pointed to the cultural value of the valley, both in terms of its natural beauty and its Welsh-speaking settlements, both of which would be destroyed by the flooding of the valley. As with the previous schemes, this reservoir was imposed on the landscape and the community without any real consultation with local people or their representatives. Although the fight to save the valley was unsuccessful, this case is often cited as a watershed in the development of Welsh nationalism. As Evans (1991) comments:

> "Plaid Cymru lost the fight. The valley was drowned, the community scattered, the water seized. Nevertheless, the campaign was seminal…Plaid Cymru made water a great national issue, important not only in itself but as symbolising the humiliating political and economic position of Wales. It hammered home the fact that one of the richest Welsh natural resources was being exploited without benefit to the Welsh people…" (100).

These political campaigns were fought in rural Wales where the landscape was viewed as special and the Welsh language remained strong. Plaid Cymru was less vocal about the economic and environmental exploitation of another natural resource of Wales – coal - in the South Wales Valleys. Indeed, for Welsh nationalism, the Valleys represented a rather despoiled space in physical and cultural terms, with the mining industry scarring the natural landscape and displacing Welsh as the everyday language through its attraction of workers

from outside Wales[4]. However Charlotte Williams (2012) suggests that other political movements were beginning to relate working conditions in the Valleys (and other industrial places in Wales) to broader injustices associated with colonialism and slave labour in other countries:

> "The shared plight of the factory slaves at home and the plantation slaves elsewhere had an echo right across Wales with the quarrymen, the iron smelters, the black faced miners, all knew what it meant to be robbed; beaten down, have their language, their culture, name and place stolen from them – what it was to be enslaved" (171).

4. Opencast mining in the South Wales Valleys: contemporary forms of post-colonial environmental injustice

Opencast mining has taken place in the South Wales Valleys for several decades. As deep mines closed in larger numbers during the latter decades of the twentieth century, opencast activities began to take on increased significance. Opencasting was viewed as a more efficient form of mining in a couple of ways: it was able to generate new supplies of coal at lower costs than deep mining and it could extract coal from exhausted deep mined sites. In addition, planning conditions attached to mining licences were meant to ensure the restoration of sites after the completion of mining operations. Following the privatisation of the coal industry in 1993, Celtic Energy – the company that secured the mining contract for Wales – developed a plan to extend the scale of opencast mining, with most of its proposed activity in the Valleys. This plan generated widespread opposition from local communities and environmental organisations, and an umbrella campaign group *Wales Against Opencast* was established. The group sought to challenge some of the dominant narratives of opencast mining, claiming that 'the communities built on coal are no longer behind the work or trust the companies who talk of "voids" not mines, and

---

[4] Plaid Cymru has become much more interested in the Valleys during recent years and in 2011 launched its *Greenprint for the Valleys* consultation, which sought to develop new forms of environmental and community-based regeneration in the Valleys.

"overburden mounds" not tips"'(Beynon et al., 2000, 203). It also attempted to scale-up local opposition to open cast mining by engaging with the work of the global environmental organisation, *Earth First!*, with comparisons made between the plight of Valleys communities with those of 'indigenous peoples the world over struggling for *their* land' (ibid., 203).

Despite this opposition, opencast coal extraction in Wales increased across the early 1990s, peaking at three million tonnes (mt) of coal in 1995, but then falling to around 1.2 mt per year in the early 2000s. More recently, there has been an escalation of opencast mining activity in Wales. As can be seen from Table 1, in excess of 2 mt of opencast coal has been produced annually during the last five years and in 2014 – the latest year for which statistics are available – opencast coal production in Wales stood at 2.5 mt. Placing this figure in context, it is only slightly below that recorded for England (2.9 mt) even though the land area of Wales is only 16 per cent that of its neighbour. Another point worthy of mention is that the size of opencast mines has increased dramatically in recent years. In 2014, just eight sites in Wales produced 2.5 mt of coal, one fewer than were operating in 2003 when less than half this amount of coal was extracted. It is also clear from Table 1 that opencast mining activities are very much concentrated in the Valleys, with 83 per cent of Welsh opencast coal production in 2014 occurring in just three local authority areas, all in the Valleys: Merthyr Tydfil (38 per cent), Neath Port Talbot (21 per cent) and Rhondda Cynon Taff (24 per cent). Indeed, when we look at these data in more detail, we see that Merthyr Tydfil – where one of our case study mines is located - has moved from having no opencast mining activity within its area in 2007 to generating the largest tonnage of coal of any local authority area in Wales (and the third largest in Great Britain) in 2014.

INSERT TABLE 1 ABOUT HERE

We now move on to consider this expansion of opencast mining in the Valleys in more qualitative terms. We do this by exploring understandings and experiences of mining, landscape and place from the perspectives of different local stakeholders. Our focus is on a couple of opencast mines – one currently

operating, the other a proposed site of mining activity. The first, Ffos-y-Frân, is located close to the town of Merthyr Tydfil, in the upper parts of the Valleys, and has been active for eight years. It covers 367 hectares and is expected to produce almost 11 million tonnes of coal between 2007 and 2025. The second mine, Nant Llesg, lies just over the mountain, near the town of Rhymney, and has been identified as a potential mining site by the company operating the Ffos-y-Frân site. Planning permission was sought in 2013 to extract six million tonnes of coal over a period of 10 years on a site of 478 hectares.

The bulk of our research was conducted in 2013 with some additional data collection in 2015. Semi-structured interviews were undertaken with 13 key stakeholders involved with these mines, including the directors of the mining company, local councillors, a community opposition group and local residents living in close proximity to the mines. In addition, one of us attended meetings held by the community opposition groups. We also made use of materials collected as part of the planning inquiry into the proposed Nant Llesg scheme, particularly the evidence from a community consultation exercise that resulted in submissions from 35 local residents. Finally, we examined a variety of texts relating to the mines, including media reports, Welsh Government policy documents, poems, campaign leaflets and other vernacular outputs. Materials collected during the research process were analysed using conventional techniques of coding and sorting, with the structure of the interviews helping to frame the analysis.

i. Opencast mining, ecological restoration and 'ordinary political injustices'

Ffos-y-Frân is not classified as a mining project but a land reclamation scheme. Described by the mining company as 'the largest land reclamation scheme in western Europe', it represents the final phase of a restoration project that stretches back almost half a century. The site was officially categorised as 'derelict' in 1972 by a survey of derelict land undertaken following the Aberfan disaster. According to the company, the land has been subjected to 'hundreds of years of industrial abuse', involving the mixing of topsoil and mining waste, which has produced a deficit of soil. Through this reclamation project it is

claimed that 'we're able to recover some of the soils that were being buried and bring them back to life…so the whole area will be soiled and put back to either forestry or grassland'. However, this outcome will only be achieved following a further 18 years of mining activity involving the extraction of several million tonnes of coal from the mountain.

The reason that mining is required to restore the site relates to the historical liability to restore this site, which rests with the local authority, Merthyr Tydfil Borough Council. The estimated cost of £300 million to make good this derelict land could not be met by the Council, which meant that it had to consider other mechanisms to bring about restoration. By allowing the mining company to extract additional coal from the site, the Council has been able to offload its liability and secure annual payments from the company based on the volume of coal extracted. In the words of a local councillor:

> "The reason they [the Council] supported it [was] because X [Council officer] said the problem was that this was a toxic piece of land that the Council did not have the resources to clear or reclaim it, and it was a way of sacrificing the immediate for long-term gain".

This 'sacrifice' is not being made by the local authority or the mining company but by those residents living close to the mining site, who will experience everyday disruptions and concerns about pollution over many years before their local landscape is returned to its natural form. Our interviews reveal strong feelings amongst members of the local community that their views on this opencast mine have been largely overridden by financial pressures faced by the local authority. There has been a failure of the planning system for those living alongside the mine in ways that resonate with Fraser's (2006) idea of 'ordinary political injustice'. Opencast mining is viewed as representing the latest of a long list of environmental (and other) injustices experienced by the community. For example, a recent attempt to locate a huge waste incinerator in the local area was successfully opposed by the community. As Barbara comments:

16

"…it's as if they're forgetting the area['s] history…what else can they throw at us? And it's not fair because there's a lot of poverty here, there's a lot of illness here…I mean we've sacrificed enough in this area over the years for energy."

Others pointed to historical injustices associated with coal extraction. It was suggested that although mining had 'put food on the table…it killed; people didn't get to enjoy their retirement out of that. They gave their lives for the industry and for, okay, a living wage, but I would say [they were] exploited' (George). Similarly, Alan comments that despite the community's roots being in mining, 'you will find the community now…doesn't have any desire at all to see it come back. They have felt like over the years they have been the victims of mining rather than the beneficiaries'. Mike Jenkins, a local resident and celebrated poet, also discusses Ffos-y-Frân in terms that connect past and present forms of environmental and political injustice, stating that 'it seems to demonstrate how little we've advanced, how we're still exploited for the "black stuff" despite all the cosmetic greening' (2012). Furthermore, he argues that the planning system is enabling the contemporary exploitation of his local area, as 'they [planners] would not allow such a site…in the leafy lanes of Radyr and Creigiau[5]' (2012). Such a view is shared by the journalist George Monbiot, who claims that Ffos-y-Frân represents a failure of deliberative democracy:

"Everything about the scheme is odd. The edge of the site is just 36 metres from the nearest homes, yet there will be no compensation for the owners, and their concerns have been dismissed by the authorities. Though local people have fought the plan, their council, the Welsh Government and the Westminster Government have collaborated with the developers to force it through." (2007)

Members of the National Assembly for Wales have also been critical of this disconnect between opencast mining, the planning process and the views of

---

[5] These are affluent suburbs of Cardiff, the capital city of Wales.

local communities. In a debate in April 2015, William Morris AM[6] argued that 'many people living in close proximity to opencast sites have little say in the way these sites affect, indeed blight their lives' (2015). The outcome of this debate was that Assembly Members voted for a moratorium on further opencast mining in Wales. However, the Welsh Government refused to endorse this vote, arguing that additional opencasting is required to complete restoration works relating to previous sites of mining. The Minister for Natural Resources criticised the privatisation of the UK mining industry in the 1990s for being more concerned with maximising revenue for the Treasury than securing financial bonds from the new mining companies to enable the adequate restoration of exhausted coalfields. The consequence of this approach, the Minister suggested, was that insufficient public funds are now available to restore expended mining sites in Wales, meaning that restoration can only be achieved through further rounds of opencast mining (see also Monbiot, 2015).

ii. Contradictory discourses of mining, place and landscape

Discussions about the Ffos-y-Frân and Nant Llesg sites are bound up with multiple and contradictory meanings of coal mining, landscape and place. Coal extraction cuts against dominant national policy discourse on energy and climate change mitigation, with the Welsh Government actively promoting a transition from the use of fossil fuels to renewable and nuclear sources of energy production. For example, in its recent policy document, *Energy Wales,* the First Minister writes boldly about 'taking the lead on energy and [being] determined that we work effectively and use all of Welsh Government's ability to deliver a positive transition to a wealthy, low carbon future' (Jones, 2012, 5). The communities surrounding these two opencast mines concur with Jones' aspiration for this low carbon future. As Barbara comments, 'we've got a wind farm coming up at the top but I can put up with that [as it is] clean energy'. References to coal production are conspicuous only by their absence from *Energy Wales*, perhaps because coal mining represents an 'inconvenient truth'. Indeed, the mining company claims that the realities of energy security in Wales

---

[6] Assembly Member

and the UK will require the continued, and perhaps increased, extraction and burning of coal for the production of energy in future years:

> "If you look at policy, everyone perceives coal as not being around anymore and I think it's very naïve of politicians in terms of doing that because in the short to medium term of the next 10 to 15 years it's probably the only source [of energy] that is readily available."

We can construct our opencast sites as remaindered spaces in the sense that they sit outside of national energy policy discourse; they also remain hidden from the gaze of politicians, the public and the media. As Monbiot comments, 'the most remarkable fact [about Ffos-y-Frân] is this: outside Merthyr Tydfil, hardly anyone knows it is happening'. This point is echoed by local people, who describe their situations as being conveniently ignored by the Welsh Government, the local authority and the media. As George, a member of a local campaign group, states, 'nobody knows what's happening up here and nobody wants to know…the local article wouldn't carry anything and [so] there's no way you can get anything into the regionals, let alone into the nationals'.

A second area of contradiction relates to regeneration and employment. The mining company claims that Nant Llesg mine will create between 144 and 239 direct jobs and 173 to 249 indirect jobs during the course of its operation. It stresses that these jobs are much needed in the area, given that it contains some of the most deprived communities in Wales. In addition, the company will provide a community benefit fund of up to £6 million during the course of its operations. Within its planning application, these local economic and financial benefits represent key arguments used by the company's to support the mining proposal: that the area's high levels of unemployment and deprivation justify the destruction of its local landscape. This economic narrative is countered by local opponents of the scheme in two main ways. First, an alternative economic argument is deployed that moves beyond job creation within the mining operation to consider the wider economic impacts of the mine. In particular, it is claimed that the mine will impact negatively on other forms of economic development in the area. An opposition group highlights the benefits that

sustainable regeneration projects have brought to the area in terms of attracting 'clean' companies and developing the tourism industry. Fred, the group's coordinator and a managing director of a cosmetics manufacturing company based in the area, claims that increased levels of dust produced by the proposed mine may force him to relocate his factory to another area, with the loss of 120 jobs. As Fred comments, companies such as his have been attracted to the area in part because of the 'clean air, water and green landscape'. Others in the community also mention the negative impact of the mine on jobs:

> "You are giving a picture of happy smiley faces. There is no mention of the ill health though [or] the bad environment this will bring. Jobs will be lost in Rhymney due to the opencast. There is no way I will support this.' (Tom)

The second narrative developed by opponents contests the emphasis placed on the economic and financial benefits of the mine, and, more broadly, on the commodification of the local landscape. In the public consultations, the minority of people who supported the mining proposal did so on the basis of job creation. For example, Jon comments that 'I think it's a very good idea on the forefront (sic) of getting people in the upper valley into work and also it's for the purpose of energy. I'm impressed that there's work coming to the Valleys'. However, even those who supported the mine tended to balance economic gains with the environmental and community impacts of the proposal:

> "I understand the economic benefits such a scheme would bring to a very deprived area but this has to be balanced with the views of local residents, but most importantly the environment to cause as little disruption as possible to local communities." (Kevin)

> "The layout shown seemed to be well thought out and I hope the operation will not hurt our environment too much or inconvenience our lives. Hopefully it will provide much needed jobs to this area. Training would be important to the youth of this area." (Joan)

Debates about these opencast sites also highlight contradictory meanings of the local landscape. For those opposing the mining proposal, the potential damage to the local landscape is constructed as a much more significant concern than local economic development or community financial gain. Indeed, frequent reference is made to the non-economic value of the threatened mountain, particularly the cultural attachments people have developed towards their everyday and familiar landscape. In response to the public consultation on the Nant Llesg mine, Jane comments that 'nothing could compensate us for the loss of our mountain' while Peter states that 'I don't want you to dig up our mountain and drain the lake…The wildlife is important to me and I don't want you to frighten it'. Mention of *our* mountain here is indicative of people's sense of informal ownership of and belonging to the local landscape. Others also value the mountain for its visual aesthetics and as a 'space of escape' for walking, play and encountering nature.

The ecological restoration of sites of previous mining activity in other valleys is widely welcomed by the local community, even though some share Basini's (2008) feeling of these restored spaces as 'sterile, plastic landscape[s]'. The renewed naturalness of the upper region of the Valleys is helping to recast people's sense of identity and well-being in these communities, providing hope for the future. As Mike remarks:

> "We have enough problems in this area already. We are the third most deprived area in Wales. At least at the moment we can look out at green mountains and a pleasant environment. Seeing the blackness of opencast on our mountain again would destroy our feeling of well-being and lead to even more mental health problems."

In this sense the greenness of the mountain is viewed as compensating for the material hardships and health problems experienced by some in the local community. The mountain also acts as a signifier of the natural beauty of the upper Valleys and provides a reminder of what could be lost - here and elsewhere - if mining returns to the area. As Barbara comments, 'I know it's a

poor area but it's getting to look far more pleasant now. And of course this is just the start. If they get this it's going to be a domino effect right down the valley.'

The mountain is discussed in somewhat different terms by the mining company, as a space of physical danger and social deviancy. It is noted that the area is 'riddled with old collapsed land…previously tipped colliery spoil tips right at the foothill of the mountain…and part of that also included material from the tidy up from Aberfan'. Mention is also made of the abandonment of historic deep mines without the appropriate capping of the entrances to mine shafts. Consequently, people accessing the area for recreation are 'not aware of the dangers that exist…we've come across numerous uncharted accesses, vertical shafts to underground mine workings…people were walking over them and not realising what they were walking over'. For the company, then, a technical discourse is used to construct the mountain as a problematic space that requires specialist remediation. However, the company directors move beyond the technical realm to question the social and cultural value of the mountain. Reinforcing stigmatic media representations of towns in these two valleys, and Merthyr in particular (see Thomas, 2016), the company describes the site as a residual socio-cultural space that is attached little value by the local community and eschewed by residents except those 'accessing this site normally to steal cars, scramble around the top and then set fire to them as the police came'.

These contradictory discourses of mining, landscape and place are also evident within the planning meetings held to decide on the Nant Llesg opencast mining proposal. On June 24th 2015 Caerphilly Borough Council's planning committee met to consider the planning application for the mine. Councillors rejected a recommendation from its planning officers to approve the proposal, deferring their decision to enable officers to provide a legal basis to refuse the proposal. One of the councillors opposing the application argued that the mining company's plans:

> "contradict themselves on many levels…There was a lot of concern locally and I'm glad the planning committee share the views of the

community. I'm very happy that even though the planning recommendation was for permission to be granted, the voice of the community was heard." (quoted in Hill, 2015)

At a second meeting on August 5th, officers identified the visual impact of the mine as the only legitimate reason for opposing the mining application, allowing councillors to reject the scheme. During the debate the chair of the planning committee stated that 'I think the people of the upper Rhymney Valley are being asked to pay too high a price for this development', while another councillor commented that 'it's not about the money, it's about the people'. This emphasis on the needs of community contrasts with the tone of the statement issued to the media by the mining company:

> "It's a rejection for a project that's going to introduce hundreds of millions of pounds into the local economy, into an area that is desperately deprived, one of the most deprived areas in south Wales. I mean, who else is going to bring this sort of investment into the upper Rhymney Valley?" (Eden, 2015)

On 23rd December 2015 the mining company submitted an appeal to the Planning Directorate against the refusal of the Council to grant planning permission for the mine. A key part of its appeal is that councillors went against the recommendation by their officers that the benefits of the mine outweighed any environmental impacts. In its covering letter, the company makes reference to the mine's contribution to energy security, economic development and community as justification for support of its application, stating that 'the overall balance of the national need for coal and the other benefits associated with the development against any environmental effects weigh heavily in favour of a grant of planning permission'. The outcome of this appeal is awaited.

5. Conclusion

In this article we have explored the geographies of environmental injustice using a case study of opencast mining in the post-industrial spaces of the South Wales Valleys. What emerges from our research is a complex set of relations between environmental injustice, landscape and place. It is clear that the particularities of place and landscape play a significant part in shaping the contours of environmental disputes, with the economic, political and social configurations of place influencing understandings of and actions on the local environment. Temporality also matters here. The dispute over opencast mining in the Valleys is as much to do with previous approaches to place and landscape as it is with current ones. Indeed, it is the layering of new forms of environmental and social injustices on top of historical ones that has been pivotal in shaping discussions of future mining operations in this region, with the persistence of poverty, uneven economic development and environmental degradation being used by the mining company to justify the siting of new mines in the area and by the local community to contest the company's proposals and develop alternative futures for landscape and place (see also Purdy, 2011).

Our research also demonstrates a set of scalar politics associated with environmental injustice. Different scalar arguments are being mobilised by different groups to support their claims. The global nature of climate change is (partly) utilised by the community in its opposition to the mines. References are made to the national scale by both supporters and opponents of the mines: the mining company claims that national energy policy remains dependent on the continued use of coal; the Welsh Government points to the failures of previous UK mining policy as its justification for further opencast mining; and community groups argue that the clean(er) energy policies of both Welsh and UK governments require the prohibition of future coal production. In addition, there exists a tension between the local and non-local aspects of these mining operations. As was the case with earlier resource struggles in rural Wales, there is a sense that the local landscapes of the post-industrial Valleys are being sacrificed for the benefit of distant others. As with the previous disputes, local people feel that there has been a failure of deliberative democracy, with the mines being imposed upon them by powerful political and economic actors in spite of the opposition of the local community. However, a key difference

24

between these past and present landscape disputes is that the resurgence in opencast mining is no longer pitching Wales against England, but different political actors <u>within</u> Wales, the region and the local authority, with support for Ffos y Fran provided by the local council, the proposed moratorium on opencast mining being opposed by the Welsh Government, and the coal produced by these mines being largely used within the South Wales region.

Struggles about environmental justice are also concerned with competing 'geographical imaginings' of landscape and place. Drawing on recent writings on post-colonial environmentalism, we have argued that contemporary disputes about environmental justice in global North countries such as the UK can be interpreted as 'ongoing spatial histories' (Fields, 2011) in which dominant and subaltern groups confront each other about competing visions of the land and its resources. What we see from our research is how extractive capital, supported to an extent by the state, has sought to impose 'second nature' meanings on to landscape and place, presenting particular constructions of space in an effort to justify its modus operandi. The mountains are discussed as commodities that can be exploited for economic gain - quantified in terms of tonnages of coal to be extracted, jobs created and funds provided to local government. Moreover, in ways similar to the treatment of spaces subjected to colonial conquest, the mining company actively constructs local landscape and place in problematic terms - as peripheral, disadvantaged, despoiled and dangerous spaces. The company's fix for these problems is a technical one, involving economic modernisation and environmental remediation through a grand transformation of nature. Within this second nature discourse, local people are denied agency and expected to accept the (further) capitalist commodification and exploitation of their landscape. As the company asks in its media statement following the planning refusal: who else would be prepared to invest in such a deprived area?

Beneath this powerful and imposing discourse of second nature, local communities attempt to promote other / 'othered' meanings of mining, landscape and place. Alternative discourses are employed to question the claimed economic and social benefits of local mining, and to attach economic

value to the natural spaces of the mountains. For local people, the mountains also represent important symbols of past and the future identities of place: the previous blackness of the landscape symbolising historic forms of economic, social and environmental injustices, whilst the greenness of the present landscape has come to signify the continued post-mining regeneration of the region. Furthermore, the mountains form the backdrop for everyday life, shaping people's sense of identity, providing 'natural compensations' for economic forms of deprivation and enabling valuable interactions with nature. We consider that environmental justice research needs to take more seriously these vernacular understandings of landscape and environment, paying more attention to the ways that people are involved in the shaping of their immediate and everyday environments, and exploring how the local landscape becomes a 'place of habitus' (Olwig, 2011) that emerges more from everyday practice than external definition. We also suggest that the contradictory discourses of the mountains discussed in this article raise important questions about the 'right to landscape', including who has the right to define, represent, categorise, alter and protect landscape? We feel that there is much to be gained from further engagement with ideas and questions of the right to landscape within environmental justice research.

Engaging with post-colonial ideas of landscape should also allow environmental justice researchers to move beyond the distributive dimensions of justice to consider broader conceptions of justice that embrace the themes of representation, recognition and participation. We suggest that the community's struggle to contest opencast mining and to develop 'alternative' conceptions of landscape, place and mining can be interpreted as a kind of subalternity. Their local landscapes, places and campaign are clearly positioned in a 'space of difference outside of hegemonic networks' (Barnett, 1997, 22), with local people refusing to accept 'as given the adequacy of the dimensions of discursive space as presently constituted' (ibid., 22). These are remaindered, contradictory and forgotten spaces that perform the dirty work of capitalism: 'the places where we produce…energy with little regard for the health or beauty of the land to maintain our clean and convenient lives' (Purdy, 2011). It is unclear at this stage whether the actions of local groups constitute

a form of 'subaltern cosmopolitanism' (Featherstone, 2013) that moves beyond the spatialities of the locale and region to engage with opencast campaigns in other parts of the UK (Dunion, 2003) and beyond, such as mountain top removal in Appalachia (see Morrone and Buckley, 2011), but there are signs of wider engagements and impacts in terms of developing relationships with national newspaper journalists and environmental NGOs. Perhaps Phillips' (2011) idea of 'vernacular activism' comes closet to describing what is happening in the South Wales Valleys, with the small-scale actions in these places being 'generative in the germination and cultivation of broader political ideas, which are both distilled from and applied to particular contexts' (113).

References

Adamson, D., Burgess, K. and Dakin, A. (2014) *Regeneration in Wales*. Centre for Regeneration Excellence in Wales (www.regenwales.org.uk).

Agyeman, J. and Evans, B. (2004) 'Just sustainability': the emerging discourse of environmental justice in Britain? *The Geographical Journal*, 170(2), 155-64.

Barnett, C. (1997) 'Sing along with the common people': politics, postcolonialism, and other figures. *Environment and Planning D: Society and Space*, 15(2), 137-54.

Basini, M. (2008) *Real Merthyr.* Bridgend: Seren.

BBC (2008) *Wales History: 20th century coal mining.* http://www.bbc.co.uk/wales/history/sites/themes/society/industry_coal03.shtml (Accessed 29th October 2015).

Benyon, H., Cox, A. & Hudson, R. (2000) *Digging Up Trouble: The environment, protest and opencast coalmining.* London: Rivers Oram Press.

BGS Minerals (2015) *Surface Mine Statistics.* https://www.bgs.ac.uk/mineralsuk/mines/coal/occ/home.html (accessed 23.9.15)

Bridge, G. and Le Billon, P. (2012) *Oil.* Cambridge: Polity.

Buell, L, Heise, U and Thornber, K. (2011) Literature and environment. *Annual Review of Environment and Resources,* 36, 417-40.

Burningham, K. & Thrush, D. (2001) *Rainforests Are A Long Way From Here: The environmental concerns of disadvantaged groups*. York: Joseph Rowntree Foundation.

Castree, N. and Braun, B. (ed.) (2001) *Social Nature: Theory, practice and politics*. Oxford: Blackwell.

Deloughney, E. and Handley, G. (2011) *Postcolonial Ecologies: Literatures of the environment.* New York: Oxford University Press.

Dunion, K. (2003) *Troublemakers: The struggle for environmental justice in Scotland.* Edinburgh: Edinburgh University Press.

Eden, T. (2015) 'This is a great day for democracy and people power' – campaigners joyous after opencast mine plan is rejected'. *Western Mail*, 5th August.

Egoz, S., Makhzoumi, J. and Pungetti, G. (2011) 'The right to landscape: an introduction'. In Egoz, S., Makhzoumi, J. and Pungetti, G. (eds.) *The Right to Landscape: Contesting landscape and human rights*. Farnham: Ashgate.

Evans, G. (1991) *Fighting for Wales*. Talybont: Y Lolfa.

Featherstone, D. (2013) Black internationalism, subaltern cosmopolitanism and the spatial politics of anti-fascism. *Annals of the Association of American Geographers*, 103(6), 1406-20.

Fitzsimmons, M. (1989) The matter of nature. *Antipode*, 21(2), 106-20.

Fraser, N. (2008) *Scales of Justice: Reimagining political space in a globalizing world*. New York: Columbia University Press.

Harvey, D. (1996) *Justice, Nature and the Geography of Difference*. Oxford: Blackwell.

Heynen. N., McCarthy, J., Prudham, S. and Robbins, P. (2007) (Eds.) *Neoliberal Environments: False promises and unnatural consequences*, New York: Routledge.

Heynen, N., Kaika, M. and Swyngedouw, E. (2012) In the Nature of Cities: Urban political ecology and the politics of urban metabolism. Abingdon: Routledge.

Hill, G. (2015) Nant Llesg opencast plan faces collapse as Caerphilly councillors call for rethink. *Caerphilly Observer*, 1, 25th June.

Hobson, K. (2006) Enacting environmental justice in Singapore: Performative justice and the Green Volunteer Network. *Geoforum*, 37(5): 671-81.

Jackson, M. (2014) Composing postcolonial geographies: Postconstructivism, ecology and overcoming ontologies of critique. *Singapore Journal of Tropical Geography*, 35, 72-87.

Jenkins, M. (2012) A statement and poem by Merthyr poet Mike Jenkins http://stopffosyfran.co.uk (accessed 23rd June 2015).

Jones, C. (2012) 'First Minister's Foreword'. In *Energy Wales: A low carbon transition*. Cardiff: Welsh Government.

Llewellyn, R. (1939) *How Green Was My Valley.* London: Michael Joseph Limited.

Milbourne, P. (2012). 'Everyday (in)justices and ordinary environmentalisms: community gardening in disadvantaged urban neighbourhoods'. *Local Environment: The International Journal of Justice and Sustainability,* 17(6), 943-57.

Milbourne, P, Marsden, T. and Kitchen, L. (2008) Scaling post-industrial forestry: the complex implementation of national forestry regimes in the southern valleys of Wales. *Antipode,* 40(4), 612-31

Monbiot, G. (2007) The new coal age. *The Guardian,* 9th October. http://www.guardian.co.uk/environment/2007/oct/09/energy   (Accessed   29 January, 2013)

Monbiot, G. (2015) A hole in the system. *The Guardian, 2*8th April. http://www.monbiot.com/2015/04/28/a-hole-in-the-system/   (Accessed   22 September, 2015)

Morrone, M. and Buckley, G. (2011) *Mountains of Injustice: Social and environmental justice in Appalachia.* Athens, OH: Ohio University Press.

Nettle, C. (2014) *Community Gardening as Social Action.* Farnham: Ashgate.

Olwig, K. (2011) The right rights to the right landscape. In Egoz, S., Makhzoumi, J. and Pungetti, G. (eds.) *The Right to Landscape: Contesting landscape and human rights.* Farnham: Ashgate.

Olwig, K. and Mitchell, D. (eds.) (2009), *Justice, Power and the Political Landscape.* London: Routledge.

Phillips, R. (2011) Vernacular anti-imperialism. *Annals of Association of American Geographers*, 101(5), 1109-25.

Pudham, S. (2004) *Knock on Wood: Nature as commodity in Douglas-Fir country.* New York: Routledge.

Purdy, J. (2011) Afterword: An American sacrifice zone. In Morrone, M. and Buckley, G. (2011) *Mountains of Injustice: Social and environmental justice in Appalachia.* Athens, OH: Ohio University Press.

Said, E. (1978) *Orientalism*. New York: Pantheon.

Said, E. (2000) Invention, memory and place. *Critical Inquiry*, 26(2), 175-92.

Schama, S. (1995) *Landscape and Memory.* New York: Vintage Books.

Schlosberg, D. (2007) *Defining Environmental Justice: Theories, movements and nature.* Oxford: Oxford University Press.

Sen, A. (2009) *The Idea of Justice.* Cambridge, MA: Harvard University Press.

Sidaway, J. Woon, C and Jacobs, J. (2014) Planetary postcolonialism. *Singapore Journal of Tropical Geography*, 35, 4-21.

Smith, N. (1984) *Uneven Development: Nature, capital and the production of space.* Oxford: Blackwell.

Swyngedouw, E. 2004. *Social Power and the Urbanisation of Water. Flows of power.* Oxford: Oxford University Press.

Thomas, G. (2016) 'It's not that bad': stigma, health, and place in a post-industrial community. *Health & Place*, 38, 1-7.

Walker, G. (2012) *Environmental Justice.* Abingdon: Routledge.

Whitehead, M. (2009) The wood for the trees: ordinary environmental injustice and the everyday right to urban nature. *International Journal of Urban and Regional Research,* 33(3), 662-81.

Williams, C. (2012) *Sugar and Slate.* Aberystwyth: Planet Books.

Williams, D. (ed.) (2008) 'Introduction' In *Who Speaks for Wales? Nation, culture, identity.* Cardiff: University of Wales Press.

Williams, G. and Mawdsley, E. (2006)   Postcolonial environmental justice: government and governance in India, *Geoforum*, 37, 660-70.

Williams, R. ([1958] 1997) 'Culture is ordinary'. In A. Gray and J. McGuigan (Eds.) *Studies in Culture: An introductory reader.* London: Arnold.

Table 1: Saleable Opencast Coal Production in Unitary Authority Areas in South Wales, 2003-14 (tonnes)

	Wales	Carmar-thenshire	Merthyr Tydfil	Neath Port Talbot	Powys	Rhondda Cynon Taff
2003	1,188,915	4,198	0	365,284	461,621	0
2004	1,405,493	29,838	0	916,196	380,596	0
2005	1,235,486	20, 040	0	906,635	318,017	0
2006	1,257,073	32,117	0	822,191	402,765	0
2007	1,059,673	23,524	0	665,790	370,359	0
2008	1,632,730	9,226	379,049	842,482	401,973	0
2009	1,597,907	0	632,282	521,750	413,875	0
2010	4,423,295	0	786,602	3,262,359	374,334	0
2011	2,102,995	9,611	987,374	606,370	488,072	0
2012	2,408,313	4,821	886,992	869,400	369,228	278,572
2013	2,342,812	10,589	919,038	509,525	300,888	602,772
2014	2,488,321	11,289	952,726	513,445	415,083	595,778
Change 2003-14	1,299,406	7,091	952,726	148,161	-46,538	595,778

Source: BGS Minerals (2015)