

<b>Institution:</b> University College London		
<b>Unit of Assessment:</b> 32 – Art and Design (Slade)		
<b>Title of case study:</b> Transforming the cultural and economic value of mine water treatment sites for the Coal Authority, paint manufacturers, and local communities		
<b>Period when the underpinning research was undertaken:</b> 2017-2020		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Onya McCausland	Teaching Assistant Research Associate Leverhulme Early Career Research Fellow	April 2017 – 25/02/2018 26/02/2018 – 31/05/2018 01/09/2018-present
<b>Period when the claimed impact occurred:</b> 2017-2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b> (indicative maximum 100 words)		
<p>McCausland's research has identified and pioneered a new use for the iron solids left behind at UK Coal Authority mine water treatment sites as a sustainable pigment for use in paint. Through the manufacture of oil, watercolour, and emulsion paints, the designation of five mine water treatments plants as artworks (Six Bells, Abertillery, Wales; Cuthill, West Lothian, Scotland; Deerplay, Bacup, Lancashire, England; Saltburn, East Yorkshire, England and Tan-y-Garn, Ammanford, Wales), and engagement with the community surrounding the Six Bells mine (including the establishment of a Community Interest Company and a programme of educational and creative events), McCausland has transformed perceptions of the cultural and economic value of these industrial sites for the Coal Authority, paint manufacturers, and local publics.</p>		
<b>2. Underpinning research</b> (indicative maximum 500 words)		
<p>Onya McCausland's research considers the value of earth pigments as vehicles for examining relationships with the contemporary landscape. Her practice considers the histories, effects and legacies of the coal industry on the environment and endow landscape and abstract painting with new and environmental purpose. McCausland's research contributes original insights into how art practice can address environmental problems, focusing on the recycling of toxic waste products from the coal industry as art materials. This is underpinned by a practice that repositions mine waste as culturally significant contemporary material through the medium of painting and Land Art. McCausland demonstrates how functioning industrial mine water treatment sites gain parallel identity as landscape paintings, linking new colour with place and processes of formation.</p> <p>In November 2018 McCausland had a solo exhibition at Anima Mundi Gallery, St. Ives titled Landscapes (R1), consisting of paintings formed of ochre colour she collected from four ex-mining sites across Britain: Saltburn, Cuthill and Tan-y-Garn, and Deerplay Hill. The exhibition consisted of multi-layered, minimalist paintings, wall-paintings, a map and aerial photographs of the location where 'waste ochres' are produced as a result of the mining industry. She discovered differences between the colours depending on their geographic location by testing samples of ochre (ferric oxy-hydroxide) through the practice of painting. Working with chemists from UCL and the UK's Coal Authority, a non-departmental governmental organization, McCausland developed and refined a series of technical methods and tests to investigate the properties of the pigments through milling for optimum particle size distribution and burning to develop a range of colours. This was supported through further examination under electron microscopes and light fastness tests. The resulting paint is indexed, linking the colour with a specific geographical location, geology, and history of industry and culture. Ochre is a natural earth clay pigment or 'earth' colour and one of the oldest cultural materials. The paints created by McCausland, however, arise from newly formed earth material in the landscape produced by industrial process, meaning that these ochres result from mineral exploitation of the Earth and point towards changing environmental conditions caused by humans. Finding purpose for these distinct but related ochres, which form from flooding coal mines, reinstates their place as</p>		

culturally significant materials for contemporary culture, that encapsulate the current environmental emergency.

McCausland's works have been presented at two recent group exhibitions. In *Landscapes of the Future* (R2) at Helsinki Contemporary, Finland, curated by Beaconsfield Art Works in 2018, McCausland produced a large monochrome wall-painting made from earth minerals generated as waste from Saltburn mine water treatment scheme. The installation introduces a moment in England's mining history that indexes the present-day environmental crisis during the charged political and cultural context of the Brexit referendum. In *Europe after the Rain* (R3), Newlyn Gallery, Cornwall (2019), McCausland produced a monochrome wall installation titled *Wheal Jane* using pigment created from the runoff of a flooded abandoned mine in West Cornwall. The work is facilitated through a constructive engagement between McCausland and the Coal Authority that has led to the development of a new permanent status for five Mine Water Treatment Sites as artworks (R4). The first of these, Six Bells, was formally designated and marked with a plaque in December 2020. The sites have been made available for the extraction of ochre pigment for the production of paint, and will be opened for public access at agreed times, enabling local and wider publics to gain understanding into the processes forming the ochres. This change of status ensures Six Bells (along with the further four sites) remain linked to paint bearing its name. Aligned with the site's designation, *Six Bells Red* mineral emulsion paint (R5) and *Six Bells Burnt Ochre* oil paint (R6) were launched and made available to the public on 11<sup>th</sup> December 2020. This combined practice considers the potential for rethinking attitudes to land that is overlooked, deemed unimportant, or closed to the public. McCausland's research therefore also addresses the social and cultural issues related to the closing of mines and the value to communities of reinvesting and reworking local post-industrial sites.

### 3. References to the research (indicative maximum of six references)

**R1.** Onya McCausland, *Landscapes* (20 October 20 – 8 December 2018). Solo Show, large show of paintings using pigment from mining sites at Anima Mundi Gallery, St. Ives UK. Details can be supplied on request by UCL.

**R2.** Onya McCausland, *Landscapes of the Future* (30 November – 21 December 2018). Artwork in a group show at Helsinki Contemporary, Finland curated by Beaconsfield. Details can be supplied on request by UCL. Reviewed in *Ny Tid* (Swedish language magazine): 'The paintings in tones of ochre get a strange charge, not least when their modernistically beautiful appearance is broken against an environmentally conscious era's aversion to fossil fuels.'

<https://bit.ly/36FvDlj>

**R3.** Onya McCausland, *Europe After The Rain* (22 June – 5 October 2019). Artwork in a group show at Newlyn Gallery, Cornwall, England, curated by Simon Faithfull. Details can be supplied on request by UCL. Emerged from grant i.

**R4.** Onya McCausland, *Six Bells 51°43 33.56 N 3°07 58.63 W* (11 December 2020). Cast iron marker plaque installed on Six Bells Mine Water Treatment Site designating it as an artwork. Emerged from grant i.

**R5.** Onya McCausland *Six Bells Red* (11 December 2020). Launch of 100 1L tins of first mineral based exterior grade wall emulsion paint made using 100% mine water waste. Emerged from grant i

**R6.** Onya McCausland *Six Bells Burnt Ochre* (11 December 2020). Launch of 1000 40ml tubes of artists oil paint made using 100% burnt ochre mine water waste. Emerged from grant i.

#### Grant

- i. Onya McCausland, Leverhulme Early Career Research Fellowship, 'From Coal Mine Waste to Landscape Painting - New British Earths', 2018-2021, ECF-2018-402, (GBP92,500).
- ii. Onya McCausland, HEIF Knowledge Exchange Funding (UCL Innovation & Enterprise), 2018, (GBP19,481).

### 4. Details of the impact (indicative maximum 750 words)

The UK Coal Authority owns 75 mine water treatment schemes which prevent 4,000 tonnes of iron solids from entering and polluting local watercourses and drinking water aquifers each year. McCausland's research has pioneered a new use for the iron solids left behind at the treatment

sites as a sustainable pigment for use in paint, from which she has created paintings, installations and manufactured paint (R1-6). Through the manufacture of this paint, the designation of five mine water treatments plants as artworks, and engagement with the community surrounding the Six Bells mine (including the establishment of a Community Interest Company and a programme of educational and creative events), McCausland has transformed perceptions of the cultural and economic value of these industrial sites for the Coal Authority, paint manufacturers, and residents of Six Bells.

### **Changing the Coal Authority's Business Strategy**

McCausland's research caused the Coal Authority (a non-departmental government organisation) to rethink the significance of their industrial sites and designate them as places of cultural and natural value for a local and general public. In 2014, as part of her PhD (awarded March 2017), McCausland approached the Coal Authority and was granted access to 45 water treatment sites to collect and test samples of ochre deposits. From this she identified 5 sites to work with more substantively and in 2017, funded by UCL and then by a Leverhulme Trust Early Career Fellowship (i), began a series of commercial feasibility activities to establish a business case for the transformation of ochre deposits into pigments for artists' and house paints. The Coal Authority had previously considered the ochre deposits in their mine water treatment sites to be waste material which was sent to landfill. Tests showed that mine ochres performed well alongside high transparency synthetic grade iron oxides. As a result of their work with McCausland the Coal Authority now recognizes the value of these iron solids. The Innovation Project Manager confirmed "It is clear that through our collaboration we have attained a greater understanding of the value of ochre as a pigment, both in cultural and economic terms" (A). In a news story published on gov.uk, the Coal Authority's Principal Innovation Manager explained that the collaboration with McCausland "demonstrates the possibility of utilising ochre for a variety of uses and opens up other opportunities for the Coal Authority" (B).

To showcase these opportunities, the Coal Authority commissioned a film in 2018, "Creating art from ochre" (C). This change in understanding led them to invest GBP176,000 in the project, facilitating access to sites for the extraction of ochre, sharing expertise by cooperating with McCausland in trialling material processing and changing their business strategy to accommodate the use of ochre produced as waste material in paint manufacture. A formal agreement on 29<sup>th</sup> July 2019 between McCausland and the Coal Authority (C) led to Six Bells Mine Water Treatment Scheme becoming the first ever functioning industrial site to be designated a public work of art marked with a plaque with public access granted by appointment (C). The agreement also names four other sites for designation Cuthill in West Lothian, Scotland; Deerplay in Bacup, Lancashire; Saltburn in East Yorkshire and Tan-y-Garn, Ammanford, South Wales. In doing so, the sites and their colours are for the first time recognised and acknowledged as part of Britain's cultural, social and industrial history. The Coal Authority's Commercial Director, described the significance of this designation: "Onya's research has shown how our mine water treatment schemes are the link between the colour, the material and place, and that they represent an important part of Britain's cultural, social and industrial history and legacy" (D). Moreover, these mine ochres are the only ochre to come from an entirely sustainable source. The Coal Authority's "mission is making a better future for people and the environment in mining areas" and McCausland's research has helped them in achieving that. As he explains, iron ochre has "a unique number of properties and therefore it's become part of our mission to ensure that it's no longer considered waste and sent to landfill, as it had been in the past, but reused wherever possible to preserve the environment and to uphold the Coal Authority's commitment to sustainability" (D). In 2019 the Coal Authority installed artworks by McCausland in the foyer of their headquarters in Mansfield and have requested to showcase the paint tins and tubes alongside photographs and a painted wall (C and E).

### **Creating new opportunities for sustainable paint manufacture**

The paints created by McCausland using recycled waste materials in combination with inorganic binders have been described by industry professionals as a "new use of material in paint manufacturing". In 2020 McCausland created the first edition of a mineral based exterior/interior wall emulsion based on a potassium silicate waterglass binding system to produce the first

environmentally sustainable paint made from 100% recycled mine water ochre pigment. The paint formula has been assessed by a specialist coatings advisor, from Accord Specialist Coatings, who has attested to the transformative nature of the paints within the industry, as they are proof of concept in regards to creating fully sustainable products for the future (F). They said “The way Onya McCausland has sourced the pigments used in this coating is unique in my experience” (F). The owner and director of sustainable building specialists, Ty Mawr Lime Ltd, recognised its additional cultural value while testing the efficacy of the paint: “It is nice to be making use of materials coming out of these mines once again to produce these beautiful colours – a meaningful legacy that will also connect with the community” (F). In consultation with the community the paint has been named Six Bells Red and the first 100 tins made available for use by local people and wider publics to paint walls, fences, doors that will form a collective multi-site artwork documented and published in 2021. One example is a feature wall for the new Aberbeeg Hospital (G). A limited edition of the wall paint (R5), launched 11 December 2020, is also available for sale from the Ty Ebbw Fach Heritage Centre shop in Six Bells and from <https://bit.ly/3qz hvri> retailing at GBP100. In addition, 1000 tubes of oil paint named (in consultation) Six Bells Burnt Ochre (R6) are now available for sale retailing at GBP25. The Community Interest Company (CIC) (see below) sold 35 litre tins and 145 tubes by 31/12/20 (raising GBP7,125 for the CIC). These have been manufactured in collaboration with Michael Harding Paints which exports to over 30 countries worldwide. Michael Harding Paints have confirmed that the ochre colour competes in quality with currently available commercial artists' paints, commenting: “it is absolutely remarkable. I think the colours are absolutely beautiful, and I think that the future for them is very clear [...] It's wonderful to be part of potentially bringing some jobs again to the Abertillery/Six Bells area” (E). The oil paint manufacture has had economic benefits by creating job roles, including independent lightfast testing conducted by Dr Joyce Townsend and a workshop assistant role created for pigment preparation. The manufacture sustained production line and packaging roles at the Michael Harding factory. New technology has been created by Walker Grain Storage who adapted an industrial belt furnace to enable large scale ochre burning, and old ball mill machinery has been upcycled and brought back into use for grinding pigment.

### **Changing perception of the local landscape and generating new understanding of mining heritage for the Six Bells community**

Throughout 2019 and 2020, McCausland worked closely with the ex-mining community at Six Bells in South Wales (pop. 2396), convening three public consultations (H), a guided walk, storytelling by ex-mine workers, and art workshops that have provided opportunities for knowledge exchange changing how local people think about the mine site and its legacies. This deep engagement has led to the establishment of a Community Interest Company at Six Bells (H) which ensures profits from the manufacture of paint are recirculated back into the local community to support the work and build a programme of arts events. Before the COVID-19 pandemic, events took place at the old miners' pub, now called Ty Ebbw Fach/Six Bells Regeneration. From March to December 2020, McCausland worked with local artists to design engagement activities to deliver online. Watercolour paint box sets were made from four of the ochre pigments by artist and printmaker Nichola Goff. Lucy Harding and Hywel Clatworthy (CIC Co-Directors) distributed the sets locally to 15 families and residents to enable their participation with a guided video workshop (I) supported by a community-led Facebook group “Colour from the Mines” (J) that shared experiences, walks, and artworks using the watercolour sets, with the intention to display them in an art centre/community space in the future. Participants demonstrated that the experiential knowledge of working with the paints changed perception of their local landscape, generated new understanding of mining heritage and left participants with a strong feeling of pride and connection with place: “It was an honour and a pleasure to be involved in this project. I love my area, its heritage, its landscape. I also love art and the environment and strive to be as sustainable as possible” (J).

In December 2020, the watercolour paint sets were used again by 80 10-11 year old school children from Six Bells Primary school. Goff and McCausland led 3 one day online painting workshops. This was an opportunity for the children to learn about and use the paints, reflect on the significance of their local heritage and establish new connections with the landscape through

painting. One teacher said “The children were absolutely fascinated with the idea that the paint comes from where their school is now, that mesmerised them...they loved that it comes from their local area and they can take ownership of it, it feels very personal and it is a bit of their identity” (E). Another said “Their grandparents worked in the pits and they shared their experiences with their families when they went home” and “The children said they were the best paints they’d ever used, they really liked that it was a certain palette, this made them think of different ways to use the paint and they had a different experience” (E).

For the artists this was an opportunity to develop their own practice. Nichola Goff explained that the project had enhanced her understanding of the relationship between material and place: “I have learned much more about ochre itself and feel I have gained a better insight into our relationship as humans with material and place by seeing the different aspects people have placed importance on when presented with these ideas and materials”. She highlighted the inspirational nature of the project: “As an artist and educator I am inspired by the potential of this venture, I think giving post-industrial communities an opportunity to celebrate their landscape, to experience new pride of place, and develop this kind of intimate relationship with it in a positive way that allows for growth is a very worthwhile thing indeed” (I).

Six Bells Red and Six Bells Burnt Ochre were launched on 11 December 2020 at an online event streamed from Six Bells. It was attended by over 80 participants internationally and speakers included paint manufacturer Michael Harding from the US, the CIC co-directors Hywel Clathworthy and Lucy Harding, the Commercial Director of the Coal Authority and local Welsh Assembly Member Alun Davis who in person officially launched the paint (R5, R6) and unveiled the cast iron plaque (R4) designating the mine water treatment site. The site, now marked with a heritage plaque, enhances public understanding of the area’s history by providing recognition and memorialisation of industrial history as a significant part of British and UK heritage, whilst also making a case for its future. Clathworthy gave “an insight into what [McCausland’s research] means to [me and] other people in our mining area”. He explained “both my grandfathers were miners, they spent much of their working days below ground but I can no longer go to those places to remember them [...] sometimes it feels like we are demolishing and burying their memory”. McCausland’s work with the community represented a change in that narrative: “To me this project is another step on a journey where former mining areas stop burying the past and move on to celebrating, learning and profiting spiritually, mentally, and culturally by using what’s left of what our grandparents left us” (E). Alun Davis said “It is really great hearing about the real lived history of our Valley. And being able to see what Onya has been able to do to that, bringing that into our present, making it a part of our future... It is a real pleasure and delight to be able to unveil the plaque, and to bring this history, not just to new generations, but to a future generation that will understand more profoundly what the impact of coal *was on our people, and on our places*” (E).

#### 5. Sources to corroborate the impact (indicative maximum of 10 references)

- A. Letter from Coal Authority Project Innovation Manager (30/09/19)
- B. Coal Authority’s Principal Innovation Manager <https://bit.ly/3ieqr3b>
- C. Film commissioned and produced by the Coal Authority, directed by Jonathan Sissons 2018 <https://bit.ly/2Nbtbm9> and Coal Authority tweet <https://bit.ly/2MNzg8p>
- D. Agreement Letter from Commercial Director of the Coal Authority (29/07/19)
- E. Quotes from launch event on 11/12/20 available at <https://bit.ly/36UA0Q4>
- F. Email correspondence with Accord Specialist Coatings Ltd 13/01/21 and with Technical Director/Owner/founder Ty Mawr Lime 11/12/20
- G. Email correspondence with Hospital Director, Aberbeeg Hospital, Pendarren Rd, Aberbeeg, Abertillery, NP13 2DA 11/12/20
- H. Public Consultation event 11/01/20 held at Six Bells regeneration/Ty Ebbw Fach: <https://bit.ly/3jxlp0C> and CIC details <https://bit.ly/2YZKE3x>
- I. Video tutorials and preparing of watercolours with artist Nicola Goff for remote family workshops - <https://bit.ly/2MOcrBw>; Project evaluation document by Goff for artists workshop
- J. Colour From the Mines Facebook page <https://bit.ly/2YXYkfd> and feedback survey on Padlet