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Challenges and Methods in Defining a Serial Transboundary World Heritage Cultural Landscape Nomination – the Erzgebirge/Krušnohoří Mining Region

In February 2015, the World Heritage nomination ‘Mining Cultural Landscape Erzgebirge/Krušnohoří’ was submitted to the World Heritage Centre. The outcome of the ICOMOS evaluation process was a proposed recommendation that the nomination should not be inscribed by the World Heritage Committee; at the same time, however, ICOMOS encouraged the State Parties to revise the nomination and offered to support the revision in the framework of a so-called mid-stream process. In 2016, the State Parties duly withdrew the nomination and, as ICOMOS acknowledged the potential of the proposed property to be inscribed on the World Heritage list, a midstream process was requested in order to reformulate the basis of the nomination.

The main reason for the ICOMOS decision was that the nominated boundaries of component parts did not sufficiently reflect the landscape approach necessary for a transboundary cultural landscape nomination and, further, there was an inconsistency in the methodology for the determination of boundaries on the Saxon and Czech sides. While the Saxon component parts were mainly composed of smaller areas and monuments the Czech component parts encompassed larger landscape units. Moreover, ICOMOS recommended to strengthen the justification of Outstanding Universal Value (OUV) by emphasising more the specificities of the Erzgebirge/Krušnohoří Mining Region in comparison to other European mining regions rather than to cover too many qualities.

Following these recommendations, the justification of the selection of component parts was substantially amended. A rigorous analysis of relevant mining areas in the nominated property was undertaken. Objectives comprised a substantial reduction in individual component parts through the creation of large enough component parts to give good concordance with the cultural landscape category and a redefinition of the serial property in terms of composition, with a clearer focus on cultural mining landscapes resulting from (poly-metallic) ore mining. In particular, the reassessment of the conditions of integrity played a crucial role for the redefinition of the cultural landscape dimension. In January 2018, the revised nomination file ‘Erzgebirge/Krušnohoří Mining Region’ was resubmitted to the World Heritage Centre and, finally the ‘Erzgebirge/Krušnohoří Mining Region’ was inscribed on the World Heritage list at the 43rd session of the World Heritage Committee in 2019.

This paper focuses on sharing experiences made in defining a World Heritage cultural landscape following an intervention by an ICOMOS midstream process, and under appropriate consideration of the definition of a cultural (mining)

landscape in the World Heritage context. The process described here outlines procedures that are exemplary for World Heritage nominations in general and cultural landscapes in particular. Its methodological approach offers a model for a multi-layered cultural landscape as a transboundary and serial nomination. The case study intends to enable the transfer of knowledge and may contribute to supporting the networking of nominees in preparing World Heritage cultural landscape nomination files.

The Erzgebirge/Krušnohoří (Ore Mountains) Mining Region

The Erzgebirge/Krušnohoří (Ore Mountains) is a transboundary central European low mountain range that spans parts of southeast Germany and the northwest of Czech Republic. It stretches from the southwest to the northeast for 150 km, with an average width of 40 km. Two-thirds of the mountain region are located in Saxony and one-third in the Czech Republic.

The region is a large-scale and well-preserved example of a decentralised mining landscape illustrating the profound impact of mining activities on the development of the region and its people. Key qualities of the landscape are an exceptional diversity of raw materials, a chronological depth of more than 800 years of mining activities from the 12th to the 20th centuries, and a broad spectrum of tangible mining monuments associated with intangible cultural values that formed the region.

For more than 800 years, the whole region was shaped by mining activity. The first discovery of silver ore in 1168 in the Freiberg area and the subsequent development of the mining industry changed the landscape of the “Bohemian Forest” fundamentally. In all mining periods there have been significant and profitable mines. The region was the most important source of silver in the Old World, particularly from 1460 to 1560, and the ore deposits of the Ore Mountains are further distinguished by the historically significant exploitation of tin, cobalt and uranium ores in particular (Fig. 1).

From the beginning, the mining areas of the Ore Mountains were clearly separated from one another due to the distribution of the raw material deposits and the historic-political development. Mining areas geographically and functionally delineable from one another developed over 800 years, over a wide geographical area. The characteristic combination of topography and an uneven concentration of mineral resources, together with a mining system predominantly under state control, dictated land-use. The value of the cultural landscape is based



Fig. 1: Heaps landscape, Brand-Erbisdorf mining landscape (photo Friederike Hansell, IWTG)

on the interaction between people and their environment. This interaction is tangibly manifested by mines and their innovative technological ensembles, mineral-processing infrastructure, water management systems, and mining towns.

Mining cultural landscapes in a World Heritage context

The definition and requirements for World Heritage cultural landscapes are set out in the Operational Guidelines for the Implementation of the World Heritage Convention.¹ Related to the extent of a cultural landscape, article 11 states: *The extent of a cultural landscape for inscription on the World Heritage List is relative to its functionality and intelligibility. In any case, the sample selected must be substantial enough to adequately represent the totality of the cultural landscape that it illustrates. The possibility of designating long linear areas which represent culturally significant transport and communication networks should not be excluded.*² The appropriate use of the cultural landscape category, therefore, brings with it the need for contextualisation, spatial continuity and complexity of components in terms of density of attributes, including processes and interrelationships. Accordingly, the criterion of integrity plays a crucial role in the determination of a cultural landscape.³

To date, around 66 of the 1092 World Heritage sites can be considered to belong to the category of industrial and techni-

cal heritage (as of July 2018).⁴ Apart from three World Heritage sites in Japan, all the sites are located in Europe and Latin America. Out of these, six are inscribed only as cultural landscapes⁵ and meet the requirements for cultural landscapes set out in the Operational Guidelines.

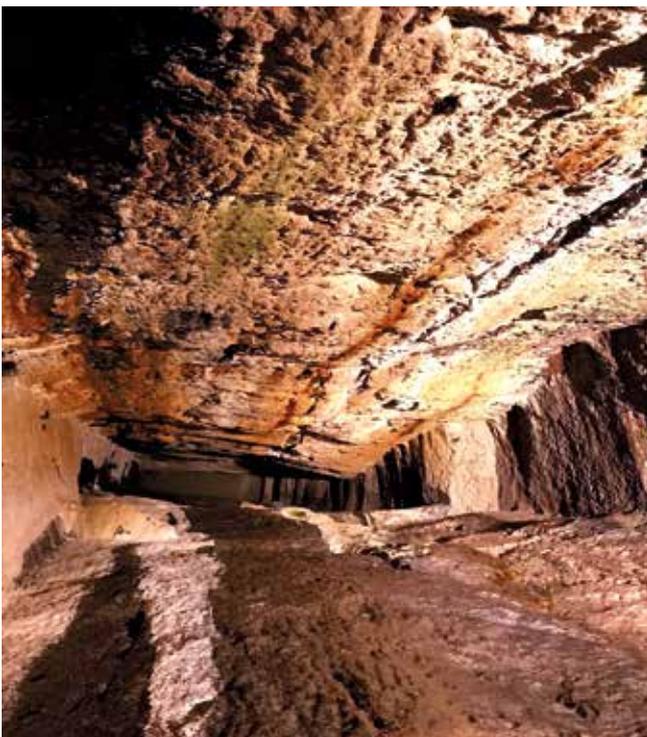
In general, mining landscapes are formed by a number of specific elements that clearly distinguish them from any other type of (cultural) landscape. The influence of the mining industry was not limited to the establishment of mine workings above and below ground and operational areas themselves, but also encompassed the broader context, including processing plants, infrastructure to support the mine, miners' housing, settlements and towns, and landscape modification due to mining. Thus, mining landscapes illustrate the working conditions and the impact of mining activities on other areas of life as well as the interaction of people with their natural environment. The landscapes bear testimony to historical, technical, social, architectural, artistic and scientific values. These values provide an insight into the diverse thematic aspects of the various mining regions and their regional or national significance (Fig. 2).

However, although the few inscribed mining or industrial cultural landscapes have common characteristics, as outlined above, there is as yet no acknowledged definition of this type of cultural landscape in the World Heritage context.⁶ This issue was also raised within the ICOMOS evaluation of the Erzgebirge/Krušnohoří nomination. As a result, in the revision process, it was crucial to explain in a better



Fig. 2: View perspective from the Arno-Lippmann shaft to the Altenberger Pinge (shaft collapse), Altenberg-Zinnwald mining landscape (photo Friederike Hansell, IWTG)

way how the ‘cultural landscape’ category is used, why it is applied and moreover suitable for the Erzgebirge/Krušnohoří Mining Region (Fig. 3).



From the 2015 to the 2018 World Heritage nomination – Revision of the proposed World Heritage nomination Erzgebirge/Krušnohoří Mining Region

ICOMOS evaluation and midstream process

The ICOMOS Panel identified two main reasons related to justification as a cultural landscape that led to the recommendation: the lack of coherence and divergent results in the component part selection for a serial transboundary property, as well as the related incorrect use of the notion of cultural landscape. It was recommended, first, to focus the proposed Outstanding Universal Value on the specificities of the Ore Mountains and, second, to strengthen the cultural landscape approach by a better illustration of functional, visual and historical interrelations within the selected component parts.⁷

The following midstream process included a field visit by two ICOMOS experts and additional desk reviews. The aim of the advisory mission was to give advice to the States Parties on the following aspects: (1) the most appropriate category for the serial nomination in relation to the potential Outstanding Universal Value and to the selection of the components; (2) the methodology applied for the selection

Fig. 3: Mine workings, Gößner mine, Annaberg-Frohnau mining landscape (photo Helmuth Albrecht, IWTG)

of the components in relation to the notion of cultural landscape; and a revised justification for inscription.⁸

Based on the recommendations given in the ICOMOS Advisory Mission Report the World Heritage nomination was substantially revised focusing on

1. Revision of the justification of Outstanding Universal Value by concentrating on specificities of the Ore Mountains, especially in comparison to polymetallic mining landscapes in the same geo-cultural region, and redefining key attributes and values;
2. Strengthening the notion of cultural landscape by revising the boundaries of the component parts so that they are large enough to reflect the landscape dimension and encompass functional, spatial and historical integrity of significant surviving mining characteristics.

Revision of the justification of Outstanding Universal Value

Based on the specificities of the Erzgebirge/Krušnohoří Mining Region identified during the first nomination process, a thorough comparative analysis has been undertaken for the mining region in order to test the values of the property against similar or potentially comparable listed World Heritage sites, selected properties on State Parties' Tentative Lists, and selected worldwide properties not listed in either. The comparative analysis was made at a global and regional level with the Erzgebirge's specific combination of attributes according to the central theme of state-controlled exploitation of ores, and the spatial and historical context, and in particular including the consideration of the cultural landscape category. The revised comparative analysis was key to identify the distinctive World Heritage attributes and values of the Ore Mountains, and accordingly for the process of redefining the boundaries and the cultural landscape approach.

As a result, the Erzgebirge/Krušnohoří Mining Region was nominated as an outstanding example of a region where innovation and interchange in mining-related developments from the 16th to the 20th centuries in the fields of technology, science, mining organisation and education diffused to become of worldwide significance. The potential Outstanding Universal Value of the nominated property is primarily founded on

- the technological and scientific achievements that emanated from the region and that were diffused worldwide from the 16th to the 20th centuries; per definition criterion (ii) requires "a span of time"⁹ which is determined as around 800 years from the 12th to 20th centuries. In each mining period the Erzgebirge/Krušnohoří played a significant role in the worldwide context;
- the development of a state-controlled mining system with all its administrative, managerial, educational and social dimensions which influenced all continental European mining regions. The long-lasting mining process is "testimony to a civilization"¹⁰ in the Erzgebirge/Krušnohoří mining region. According to criterion (iii), the region bears an exceptional testimony to all aspects that underpin the intangible dimension of living traditions, ideas and beliefs associated with the Ore Mountains' culture.
- the gradual transformation of the landscape into a coherent mining region as a result of its socio-technical history. The Erzgebirge/Krušnohoří Mining Region is also nomi-

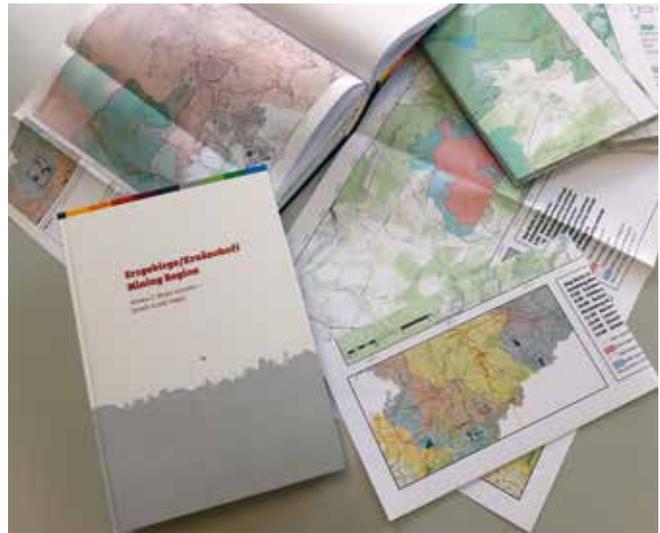


Fig. 4: Map volume, small-scale maps, World Heritage nomination file Erzgebirge/Krušnohoří Mining Region, submitted 2018 (photo Katharina Jesswein, IWTG)

nated under criterion (iv) that in this case requires the illustration of "[...] significant stage(s) in human history".¹¹ The mining region is characterised by a range of successive and evolved socio-technical systems specified for several periods and different ore resources, and a series of cultural landscapes showing the development and function of these socio-technical systems by tangible mining heritage (Fig. 4).

Revision of the series and selection of the component parts of the nominated property

The justification of the selection of component parts is the result of a number of years of joint collaboration between German and Czech colleagues, substantially amended following an intervention of the ICOMOS midstream process that took place in 2016. In accordance with the ICOMOS recommendations, a further rigorous analysis of relevant mining areas in the Erzgebirge/Krušnohoří Mining Region was undertaken. The objective was a substantial reduction in individual component parts, compared with the 2014 nomination, through the creation of large enough component parts to give good concordance with the cultural landscape category. Another aim was a redefinition of the serial property in terms of composition, with a clearer focus on the cultural mining landscape resulting from polymetallic ore mining.

Typologies of tangible elements contributing to Outstanding Universal Value

Mining and related activities shaped the territory and communities of the Erzgebirge/Krušnohoří Mining Region, creating a specific mining landscape, and mining has continuously structured the region's economy and daily life for over 800 years. In the first nomination file, in many cases the proposed component parts were complete enough to illustrate the main phases of the process such as hydraulic features,



Fig. 5: Map volume, cultural landscape maps, World Heritage nomination file Erzgebirge/Krušnohoří Mining Region, submitted 2018 (photo Katharina Jesswein, IWTG)

underground tunnel network, surface mining plants of different and complementary uses, and significant evidences of original machines and technical devices.

However, to depict clearly and justify convincingly the inscription under the cultural landscape perspective, the typologies of elements that could define a mining cultural landscape were reassessed to reinforce the landscape dimension of the property and strengthen the integrity and authenticity of the series. Therefore, in particular social attributes and natural features as part of mining landscapes were included, taking into consideration the five socio-technical systems specified for several periods and different ore resources and their tangible influences on the landscape.

As a result, the following typologies of tangible elements of the mining landscape can be discerned in the Erzgebirge/Krušnohoří Mining Region and were identified as principal elements conveying Outstanding Universal Value:

- mining elements aboveground including landscape features and built structures;
- mining elements underground;
- infrastructure to support the mines;
- miners' settlements and other landscape features (e.g. bare slopes, specific flora, agricultural structures).

The cultural landscape approach and the series

The framework for how the property is defined needs to reflect the specificity of the cultural landscape dimension represented by the series in its entirety. In the case of the Ore Mountains, this concerns geography, geology, geomorphology and landscape specificities form the basis as a unifying narrative that is linked to the development as a mining landscape. The natural features are important not in themselves but as the natural resources that allowed the region to thrive as a mining landscape.

Component parts have to be of a sufficient size and their boundaries have to be drawn using the rationale of a cultural landscape (Fig. 5). They must be large enough to reflect the

landscape dimension and encompass the functional, spatial and historical integrity of the significant characteristics of mining activities. Surviving tangible elements were assessed in relation to the selected component parts and to the criteria of authenticity and integrity to finally define the boundaries, taking into consideration the rationale of a cultural landscape. The refinement of the boundaries of the component parts and of their buffer zones aimed at strengthening the conditions of integrity for the serial nomination and the individual component parts, but also at ensuring that the series credibly illustrates a cultural landscape profoundly shaped by mining activity.

Methodology of component part selection

Five 'mining landscape types' – socio-technical systems of silver, tin, cobalt, uranium and iron – determine the evolution of the mining region. Each 'mining landscape' of the Ore Mountains was considered according to a range of criteria. These include a clear and direct contribution to each of the criteria applicable to the justification for inscription and to the proposed Outstanding Universal Value of the series as a whole. The component parts are composed of mining sites (in particular pioneer and innovative sites) relating to outstanding technological achievements and applications of global importance; mining sites demonstrating the development of various mining methods and techniques pertaining to individual socio-technical systems; educational sites relating to technological and scientific achievements of worldwide importance from the 16th to the 20th centuries; administrative and educational sites, large-scale water management systems (supply and drainage) and state-of-the-art mines related to the model of state-controlled mining organisation; mints related to the development of early modern monetary systems; technological ensembles, distinctive to specific polymetallic ores mined at different periods; architectural ensembles that demonstrate an exceptional mining-related urbanisation process; exceptional and very rare ore- and metal-processing ensembles. At the same time, they meet the conditions of authenticity and integrity of the component parts, and the nominated property as a whole.

Definition of component part boundaries

The density of attributes and a sufficient size determined the revision of boundaries. Tangible mining elements and/or areas degraded in terms of authenticity and integrity were not included in the nominated property. As agreed during the ICOMOS midstream process, the following methodology was adopted when it was not substantially reasonable to increase the size of the components:

- the application of major physical linkages represented by underground structures (e.g. drainage adits, network of exploitation galleries) to connect neighbouring mining sites of the same socio-technical system; and
 - the definition of a unique buffer zone to sustain relevant setting that contributes character and understanding, and provides visual connection, in terms of the cultural landscape.
- The boundaries were determined based on mapping 'historic' site perspectives, current airborne laser scans and on-site visits, all guided by the revised cultural landscape approach agreed during the ICOMOS midstream process. As a rule and result

of this process, small and isolated properties as well as smaller mining districts of less importance were only taken into consideration if they are closely related to a given socio-technical system, contribute significantly to the overall selection criteria, and fulfil the conditions of authenticity, and integrity.

As a result, the boundary of the nominated property as a whole has been drawn according to the rationale of a cultural landscape, which brings with it the need for contextualization and which encompasses its functional, spatial and historical integrity, both above and below ground. The boundaries of the component parts include all attributes related to the mining system, i.e. mining sites and operational areas, processing sites, infrastructure to support the mine, miners' living sites, aspects of settlement stimulated by mining and landscape modifications due to mining, necessary to convey the significance and characteristics of each part as it contributes to the full expression of the Outstanding Universal Value and the integrity and authenticity of the property. The boundaries were drawn to include the setting and the functional links with the environment and other elements of the mining system. Buffer zones have been applied to protect the nominated property from adverse effects and, additionally, to protect the important setting. The setting includes physical monuments and landscape components which provide additional historical context and a physical space in which events could affect the visual appreciation of these elements. It also encompasses degraded elements in terms of authenticity and integrity (e.g. forest areas and settlement structures) that, however, represent important setting (Fig. 6).

The 2018 World Heritage nomination 'Erzgebirge/Krušnohoří Mining Region'

As a result of the revision process, the initial 85 component parts were reduced to 22 – explicitly representative of the specificity of the Ore Mountains, especially in comparison to mining landscapes in the same geo-cultural region. The 22 component parts together represent the most significant mining heritage, both above and below ground, of the distinctive cultural region of the Ore Mountains. The nominated component parts contain all the necessary attributes of proposed Outstanding Universal Value that are manifest in a regional spatial range. The proposed OUV of the 'Erzgebirge/Krušnohoří Mining Region' is primarily founded on criterion (ii): the technological and scientific achievements which emanated from the region and were diffused worldwide from the 16th to the 20th centuries; criterion (iii): the development of a state-controlled mining system with all its administrative, managerial, educational and social dimensions which influenced all continental European mining regions; and criterion (iv): the gradual transformation of the landscape into a coherent mining region as a result of its socio-technical history (Fig. 7).

The category of cultural landscape, category (ii): organically evolved landscape, has been applied to the Erzgebirge/Krušnohoří Mining Region. When considering the further two sub-categories,¹² the Erzgebirge/Krušnohoří Mining Region is anchored as a substantially relict landscape but is also partly relevant as a continuing landscape in that parts of the



Fig. 6: Miner's parade in Freiberg (photo J. Kugler, © IWTG)



Fig. 7: Water management system, Großhartmannsdorfer pond, Freiberg mining landscape (photo: Friederike Hansell, IWTG)

landscape retain an active social role in contemporary society that is closely related to a traditional way of life and in which the evolutionary process is still in progress.

A serial nomination was necessary to appropriately represent the scale, diversity and optimum concentrations of attributes and values across the cultural landscape. Component parts of the Erzgebirge/Krušnohoří Mining Region have been selected to preserve, protect and conserve the amount necessary to convey the meaning and stories associated with it. Each component part displays clear, tangible, physical patterns and elements, and all are closely connected with each other in terms of function and technology, chronology and culture. They reveal how and why the landscape was shaped, why it now looks this way, and how it reflects intangible values and associations. Each component part contributes to the proposed OUV of the property as a whole in a substantial, scientific, readily defined and discernible way that is easily understood and communicated. The component parts include all successive and evolving socio-technical systems specified over several periods and ore resources as well as all key interrelated interdependent and visual elements.

Together, the serial property forms a coherent mining landscape reflecting the history of mining and its far-reaching impact on the Erzgebirge/Krušnohoří Mining Region and beyond.

Herausforderungen und Methoden bei der Definition einer seriellen grenzüberschreitenden Welterbe-Kulturlandschaft – die Montanregion Erzgebirge/Krušnohoří

Das Erzgebirge repräsentiert eine grenzübergreifende Region, deren Landschaft und Kultur unmittelbar mit dem Bergbau verbunden ist. Der Erzreichtum gab dem Gebirge seinen Namen und über 800 Jahre Bergbau haben eine außergewöhnliche Kulturlandschaft geprägt – ablesbar an zahlreichen montanen Sachzeugen über- und untertage, an Bergbaulandschaften vom Silber- über den Zinn- und Kobalt- bis hin zum Uranbergbau sowie einer Vielzahl von historischen Bergstädten mit ihren administrativen, sozialen und kulturellen Strukturen. Seit 1998 auf der deutschen Tentativliste wurde der Welterbeantrag „Montanregion Erzgebirge/Krušnohoří“ als serielle grenzübergreifende Kulturlandschaft 2015 erstmals beim Welterbezentrum in Paris eingereicht. Nach intensiven Beratungen und auf Empfehlung von ICOMOS wurde der Antrag im April 2016 zurückgezogen. Wesentliche Begründung für die Empfehlung war die ungleiche Definition der Grenzen in beiden Vertragsstaaten und die daraus resultierende unterschiedliche Darstellung der Kulturlandschaft. Begleitet durch einen ICOMOS „Midstream Prozess“ wurde daher der Antrag insbesondere im Hinblick auf die einer Welterbe-Kulturlandschaft entsprechende Auswahl und Zusammensetzung

der Bestandteile sowie die vorgeschlagene Begründung für eine Eintragung des Gutes als Kulturlandschaft überarbeitet und gestärkt.

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UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, 2017.

¹ UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, 2017, Annex 3, paragraphs 6–13.

² UNESCO, Operational Guidelines, 2017, Annex 3, paragraph 11.

³ UNESCO, Operational Guidelines, 2017, paragraph 8.

⁴ Assignment as industrial and technological properties varies. The estimated number is based on the list “Industrial and Technical Heritage in the World Heritage List” published by ICOMOS in 2011 (ICOMOS August 2011). The author augmented the list with further industrial and technological properties inscribed until and including 2018.

⁵ Including Nord-Pas de Calais Mining Basin (France), Hallstein Dachstein/Salzkammergut Cultural Landscape (Austria), Iwami Ginzan Silver Mine and its Cultural Landscape (Japan), Blaenavon Industrial Landscape (UK), Cornwall and West Devon Mining Landscape (UK), and Fray Bentos Industrial Landscape (Uruguay).

⁶ Definitions were discussed at two recent conferences in Freiberg and Dortmund, compare ALBRECHT/HANSELL, Industrial and Mining Landscapes, 2013; and Industrielle Kulturlandschaften im Welterbe-Kontext, 2016.

⁷ The information was part of the verbal and written consultation process between ICOMOS and the States Parties during the evaluation process.

⁸ The terms of reference were agreed between ICOMOS and the States Parties.

⁹ UNESCO, Operational Guidelines, 2017, paragraph 77, (ii).

¹⁰ UNESCO, Operational Guidelines, 2017, paragraph 77, (iii).

¹¹ UNESCO, Operational Guidelines, 2017, paragraph 77, (iv).

¹² UNESCO, Operational Guidelines, 2017, paragraph 10.