Locating Former Nazi Terror Sites: A Methodological 'How-To' for Archaeological Research and Heritage Management

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Since the 1980s, there have been increasing efforts by heritage offices in Germany and Austria, and many of the countries that were occupied by Nazi Germany during World War II, to locate places of former Nazi terror and, where possible, to protect them from further destruction in order to preserve them as places of remembrance for the victims of National Socialism. However, methodological considerations and approaches for locating, recording, and eventually assessing the 'heritage value' of former Nazi terror sites remain rather obscure, since little has been published on the methodological approaches taken by different institutions. This article presents a systematic workflow for recording former sites of Nazi terror, which was developed in the framework of the Natzweiler-Concentration-Camp-System-Project based at the Heritage Office of the State of Baden-Württemberg (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart). It aims to provide a methodological 'How-To' for creating archaeological inventories of former Nazi camps, associated sites and whole 'landscapes of destruction', hints at where to locate useful primary sources, but also to critically reflect on challenges encountered during the project and how they could be approached in the future.

1. Locating and researching Nazi camps: current approaches in heritage management

Since the 1980s, there has been a considerable increase in archaeological investigations of former Nazi camps in Germany and Austria, and in many of the countries that were occupied by Nazi Germany during World War II (WWII). The major incentive for archaeologists to get involved actually came from civil society and grassroot initiatives, which demanded that the material remains of Nazi terror be

confronted (Hausmair in press). In several German federal states as well as in Austria, heritage authorities have been making increasing efforts to locate places of former Nazi camps and, where possible, to protect them from further destruction and preserve them as places of remembrance for the victims of National Socialism. Today, the heritage authorities of the State of Brandenburg in particular take a leading role in the German-speaking regions with a firmly established commitment to record former sites of Nazi terror, systematic archaeological supervision of construction activities at former Nazi camps, and dedicated public outreach (see Kersting 2020a; 2020b; 2022; 2023). Projects for creating inventories of former Nazi camps are also being compiled in other federal states, such as Baden-Württemberg (Bollacher *et al.* 2022; Bollacher and Hausmair 2018), Berlin and Saxony (Strobel 2020), as well as in Austria (Bundesdenkmalamt 2022) and victim states of National Socialism (e.g. Brangé and Landolt in prep).

Nevertheless, methodological considerations for locating former Nazi camps and sites related to these internment facilities (e.g. places of forced labour, mass graves, post-war burial sites); challenges related to an integrated analysis of different kinds of sources (documents, images, archaeological sources, oral history); and the exploration of the material dimensions of Nazi terror, mainly originate from a few research projects on specific Nazi camps (for an overview, see Theune 2018a) or projects related to other contexts of modern mass violence (e.g. González-Ruibal 2020). Caroline Sturdy Colls (2015) has provided an important basis for the methodology of locating and spatially analysing such sites with her research on the former Nazi extermination camp Treblinka (Poland). Long-term projects focused on the frontlines and battlefields of World War I (WWI) are especially influential for the reconstruction and examination of entire conflict landscapes (e.g. Saunders 2001; and contributions in Stichelbaut and Cowley 2016), and provide approaches that also have been further developed for researching the nexus of industrial landscapes, war economy and forced labour during the Nazi period (e.g. Hausmair 2020). Theoretical and methodological considerations regarding the archaeology of mobile material culture recovered from contexts of Nazi crimes have been proposed, for instance, using the example of camps in Brandenburg (e.g. Müller 2016), Auschwitz (e.g. Myers 2007; 2011) or within the research project on Nazi forced labour camps in Berlin-Tempelhof (Bernbeck and Pollock 2018; Hausmair *et al.* 2021). These research projects have produced a respectable body of specialised approaches on, for example, the material structures of mass violence at specific Nazi sites, or the political dimensions of the archaeology of the Nazi era (see Bernbeck 2017; Bernbeck and Pollock 2018; Hausmair 2018; 2020; Hausmair *et al.* 2021; Sturdy Colls 2015; Theune 2018b; Dézsi and Wurst in press). In contrast, methodological approaches taken by heritage offices for locating, recording, and eventually assessing the 'heritage value' of former Nazi terror sites remain rather obscure, as little has been published on the methodological considerations of different monument authorities to date. Considering the intense efforts of heritage professionals in various states and countries to protect such sites (including intense publication activities), this is a very unfortunate situation because the sources and research necessary for creating heritage inventories of Nazi crime sites are anything but straightforward. Despite the extensive body of historical literature on Nazi camps and terror sites, information on exact locations of historically relevant places - the prerequisite for determining potential archaeological remains - is often absent, thus

demanding every heritage institution to 'invent' their own approach on how to determine potential sites for legal protection.

In this contribution, we present a systematic workflow for locating and recording sites of Nazi terror. This approach was developed and applied by the two authors for the Natzweiler-Concentration-Camp-System-Project based at the Heritage Office of the State of Baden-Württemberg, Germany (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart (LAD)). In 2018, the LAD started a project dedicated to the subcamps of the Natzweiler concentration camp in Baden-Württemberg, with Christian Bollacher as project manager. While the main objective was to locate all former subcamps and clarify if any material remains still existed and could be put under heritage protection, there was also a clear commitment not to consider Nazi camps as isolated spatio-historical entities but to understand them as part of a ruthless dictatorship and an exploitative war economy that created a complex and multifaceted cultural landscape. Therefore, the project was not limited to the locations of concentration camps but also focused on identifying remains of workplaces and production facilities where concentration camp prisoners were exploited, as well as associated forced labour and prisoner-of-war camps, connecting infrastructure, mass graves, post-war cemeteries where victims were reburied, as well as larger landscape changes related to the Natzweiler concentration camp system. Secondly, the goal of the project was to develop methodological tools and guidelines that could serve as a foundation for future, more comprehensive inventories of contexts related to the Nazi period (Bollacher *et al.* 2022; Bollacher and Hausmair 2018).

The resulting 'How-To' was initially built and then applied by Barbara Hausmair in 2018/2019 during her employment as researcher for the Natzweiler project, drawing on her previous research experience in the archaeology of the Nazi period (e.g. Hausmair 2016; 2018; Hausmair *et al.* 2021) and the methodological contributions from other research projects (see references above). Attila Dészi, who succeeded Barbara Hausmair in the Natzweiler project, has further employed and refined this workflow since 2020. In the following sections, we provide an overview of the workflow and point to useful resources. The article is meant as a possible 'How-To' for creating inventories of sites and landscapes produced in the framework of recent mass violence and, as such, hopefully will be useful for both heritage authorities and research projects alike. However, we also think it is necessary to discuss the challenges and experiences gathered during the course of the project. So while we hope to present a useful guideline, we also wish to fuel discussions on the many challenges that such projects face and how these challenges could be approached in the future.

2. A systematic 'How-To': goals - workflow - methodology

The primary goal of the Natzweiler project was to create an archaeological inventory of the material remains of the Natzweiler concentration camp system in Baden-Württemberg and integrate it into the existing recording and evaluation structures of the LAD.
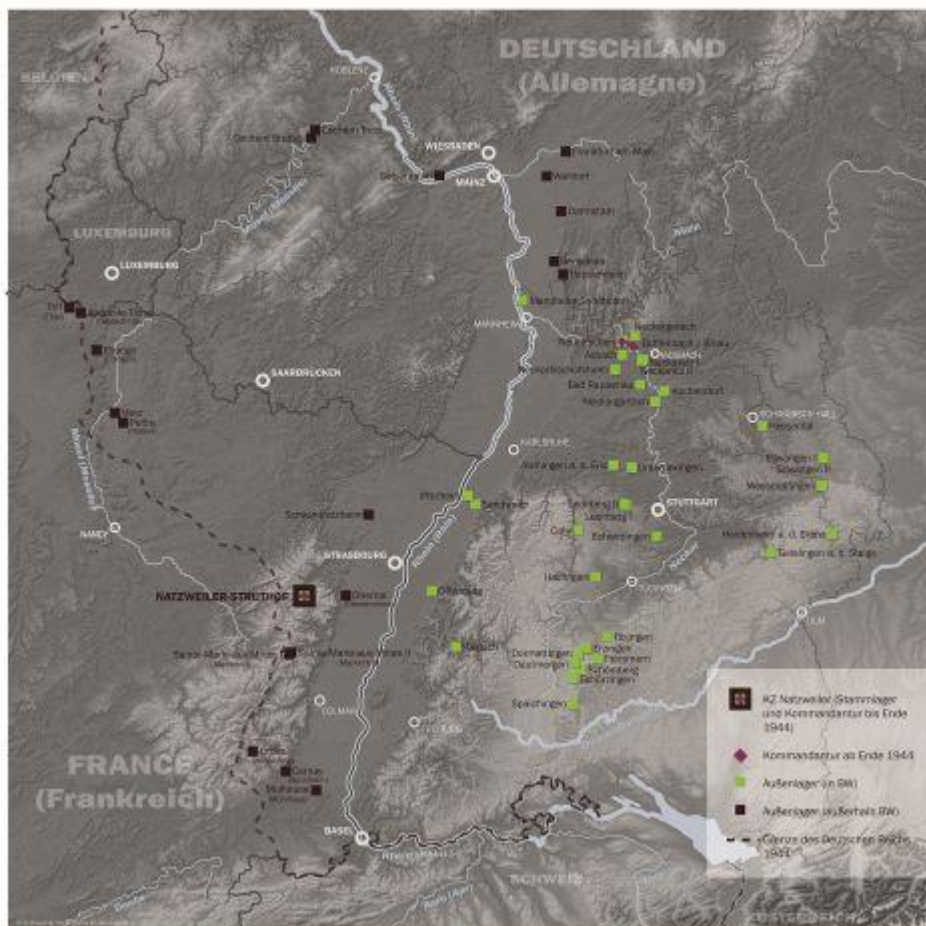
Figure 1: Map of the Natzweiler concentration camp and its subcamps (B. Hausmair/LAD; background: produced using Copernicus data and information funded by the European Union/EU-DEM layers)

The Natzweiler concentration camp was established by the Nazis in 1941 in occupied Alsace/France. During the course of WWII, and in particular from 1943/44 onwards, a dense net of Natzweiler subcamps was built in Alsace and south-west Germany, amounting to over 50 internment facilities that mainly served as hubs to provide forced labourers for the German war industry (Figures 1 and 2). Over 50,000 people from about 30 European countries were deported to Natzweiler or one of its subcamps, 38 of which were located in today's Baden-Württemberg. Historians estimate that between 14,000 to 20,000 people perished in the Natzweiler concentration camp system (Steegmann 2010), making its camps and associated workplaces important sites for cultures of remembrance, historical archaeology and heritage.

Figure 2: Operation times of the Natzweiler subcamps in the state of Baden-Württemberg (A. Dézsi)

To identify the exact locations of former concentration camps, forced labour sites, and other related sites in order to assess whether material remains have survived until the present, a multi-stage procedure was established (Table 1). As a first step, literature and source research was conducted, along with meet-ups with local memorial initiatives and local researchers. The main priority was to identify all relevant sites, roughly locate them, and identify potential areas where material remains of Nazi terror could be expected. After this initial research, historical aerial images, maps and plan documents were collected and georeferenced in order to analyse and determine the exact locations, spatial distribution and characteristics of these sites using a project-specific Geographic Information System (GIS) and modern geodata. The areas of interest identified through remote sensing were then verified through non-invasive archaeological survey methods, and selected case studies of the project were then further explored through targeted excavation. Finally, the results produced by the project were delivered to the LAD's inventory department where they were evaluated according to the current legal framework of heritage protection in Baden-Württemberg and, where possible, placed under heritage protection.

Table 1: Overview of the workflow including details on methods, sources and procedures employed during the different stages

Work stage	Methods	Sources/Procedures	Output
Initial research I	Literature and internet research	*Secondary literature* • Overview publications on Nazi terror, camps, war industry, etc. • Literature on the Natzweiler concentration camp complex in general • Literature on specific camps *Internet* • General research • Websites of Natzweiler concentration camp and subcamp memorial initiatives	• Historical background on investigated camps and associated localities incl. post-use or post-war history • Systematic recording of historical information in the project DB • Identification of relevant sites • Rough localisation of relevant sites
Initial research II	Meeting with local stakeholders/ visiting places of interest	• Exchange with local researchers and memorial initiatives • Meetings with contemporary witnesses and local residents • Visit to relevant sites together with local stakeholders	• (References to) local (unpublished) research • Exchange of knowledge • Knowledge about local history and memorial culture (absence/presence of memorial initiatives) • First approach to local sites and landscapes with the help of people familiar with the area
Source research	Archival research on specific camp complexes and armament industries	• Written sources (records of state institutions and involved private companies, letters, post-war court records, and Allied or International Tracing Service records) • Pictorial sources (plans, drawings, sketches, photographs, aerial photographs) • Audiovisual sources (tapes, videos) • Oral histories (published, conducted during project)	• Compilation of detailed historical information with special focus on spatial structures and developments • Source-critical review and analysis of the source material • Establishment of important events and developments within a camp complex • Identification of possible archaeological features to be expected • Systematic digitisation and recording of sources in project database
Localization/ spatial analysis/ identification I	Georeferencing and mapping of historical data/ localization of sites/analysis of historical-spatial relations	• Migration of historical data into project GIS • Georeferencing, localisation and mapping of relevant sites and integration • Historical aerial photographs (Allied aerial reconnaissance) • Plans and maps (construction	• Georeferenced historical spatial data • Geographically accurate localization and mapping of relevant structures • Establishment of spatial changes during the Nazi period • Establishment of post-Nazi-

Work stage	Methods	Sources/Procedures	Output
		plans, site plans, construction drawings, mine images) • Non-georeferencable historical sources with spatial information (e.g. sketches of construction projects, memorial maps of prisoners, historical photos, reports and interviews, …)	period use and disturbances (conversions, dismantling, recultivation, etc.)
Localisation/ spatial analysis/ identification II	Remote sensing	• Comparison of historical and modern geodata • Modern geodata (DOP, DGM, topographic data, administrative data, etc.)	• Identification of remains/buildings preserved above ground • Identification of possible archaeological sites (areas not covered by massive modern construction; topographic anomalies or vegetation features) • Identification of large-scale landscape alterations • Identification of post-use and post-war ground encroachments
Fieldwork I	Non-invasive examinations	• Site inspections with experts • Building archaeology • Archaeological survey • Geophysical survey (radar, magnetics, electrics…)	• Recording of structural remains of buildings and archaeological features preserved on the surface • Identification of preserved sub-surface features
Fieldwork II	Invasive examinations of selected case studies	• Drill core investigations • Test-pit excavations • Open-surface excavations	• Verification of the presence of archaeological material • Evaluation of the state of preservation • Documentation and archaeological investigations of finds and features
Monument qualification	Transfer of mapped areas and buildings to the official cadastre of monuments	• Mapping of areas relevant for monument preservation • Assessment of information by members of the inventory department	• Registration in the cadastre of monuments • Qualification of identified archaeological sites/buildings for heritage protection by the inventory department of the LAD on the basis of the information provided and in consultation with the authors
Work stage	**Methods**	**Sources/Procedures**	**Output**

As a foundation for this process, a digital infrastructure specifically tailored to the needs of the project was created that enabled systematic collection, organisation, and analysis of gathered information. This included the programming of a relational, SQL-based multi-user database by Barbara Hausmair where individual 'sites' (such as concentration camps, workplaces, mass graves, railway tracks) could be recorded

and linked together as part of a 'camp complex' within the Natzweiler system (Figures 3 and 4). For instance, the 'camp complex' 'Bisingen' consists of the Natzweiler subcamp Bisingen, three shale-oil factories including quarries where concentration camp prisoners were forced to work, one military airport, connecting infrastructure, one mass grave, and one cemetery where victims of the camp were reburied in the post-war period. Literature references and primary sources were also recorded in the database and linked to the respective sites. Bringing together all this information not only produced a large database for the project, but allowed the collected information to be easily queried and links explored between different 'sites' and 'camp complexes'. The database was integrated with the project's GIS created in the open source software QGIS, enabling the spatial analysis of various information. Once data gathering and analysis of an entire 'camp complex' was completed, the information was condensed and then migrated to suitable formats to the official monument registry system of the LAD (ADAB), where members of the inventory department undertook the assessment and, where possible, qualification for listing sites as protected monuments.

Figure 3: Data relations of the project DB (B. Hausmair/LAD)

Figure 4: Screenshot of the user interface of the 'site' form in the project DB (B. Hausmair/LAD)

2.1 Initial research I: gathering fundamental information from literature and the internet

Determining the scope of a prospective inventory of Nazi terror sites first requires understanding the specificity of a particular camp's system, in this case the Natzweiler concentration camp system. This includes literature research into its emergence and development within the larger framework of Nazi politics and the World War, the names and number of camps and profiteers involved in that system, and last but not least the victims. A first step was to study comprehensive literature on the Nazi concentration camp system and war economy (e.g. Bajohr and Wildt 2009; Buchheim *et al.* 1998; Caplan and Wachsmann 2010; Herbert 1998; Kogon 1974; Orth 1999; Sofsky 1997). For compiling an initial list of sites of interest, the Natzweiler volume (Benz and Distel 2007) of the 9-volume-series *Der Ort des Terrors* edited by Wolfgang Benz and Barbara Distel (2005-2009), as well as the *Encyclopedia of Camps and Ghettos, 1933-1945* published by the United States Holocaust Memorial Museum (Megargee 2009, 2012, 2018) were consulted. These works contain historical information about all main concentration camps and their subcamps in concise encyclopaedia-like entries, providing a good starting point. However, it should be noted that these works rarely provide details about the exact location or spatial structure of individual camps, their associated workplaces or mass graves. The lack of detailed spatial information in academic historical literature on Nazi camps was observed repeatedly during the project, and it is of note that the information provided in the encyclopaedias are not always identical (e.g. names of subcamps included in the former sometimes are absent in the latter and vice versa).

This general research was complemented by an intensive study of literature specifically dedicated to the Natzweiler concentration camp system (e.g. Brenneisen 2020; Huth 2013; Steegmann 2010), where available, publications on specific subcamps and camp complexes (e.g. Braungart 2021; Faltin *et al.* 2008; Glauning 2006; Hopmann 1994; Opfermann 2000; Scheck 2014; Zekorn 2019), and a thorough internet search for information provided by memorials, museums, and archives (e.g. websites of local memorials of former Natzweiler subcamps, the Verbund der Gedenkstätten im ehemaligen KZ-Komplex Natzweiler e.V., or the Centre européen du résistant déporté/Ancien camp de concentration de Natzweiler; see the list of memorial initiatives).

The World Wide Web is an essential search option to any research project these days. With regard to WWII or specific topics of Nazi war industry, there are a lot of websites hosted by private persons or initiatives which may provide detailed information on elements like bunkers and military installations, specific war projects or industrial sites. However, special caution and evaluation is needed when searching for and collecting information in these spheres of the internet. Not only is second-hand content provided on many sites difficult to verify, but some websites and platforms also expose militaristic attitudes or openly right-wing extremist viewpoints. It is strongly advised, both for ethical and legal reasons, to completely avoid such web content and neither reference nor give legitimacy and publicity to right-wing platforms.

During the literature review, references to other types of camps such as forced labour camps, prisoner-of-war camps, penal labour camps, and SS disciplinary camps closely associated with the Natzweiler concentration camp system were frequently found. Although these camps were not the primary focus of the project and play a subordinate role in the educational work of local concentration camp memorials, they were also recorded, provided that information could be obtained without extensive research. From a historical perspective, these camps constitute parts of their respective camp complexes regardless of administrative responsibilities or categorisation of the exploited people. It is important to note that prisoner-of-war camps and Nazi forced labour camps outside the concentration camp system are still insufficiently studied (for general studies on Nazi forced labour, see Herbert 2001; for prisoners of war, see Keller and Petry 2013), and more interdisciplinary research is needed to approach these camps comprehensively (see e.g. Drieschner and Schulz 2006; Hausmair 2023; Mytum and Carr 2012). Reference works that at least provide some guidance include the handbook and catalogue *Deutsche Kriegsgefangenen- und Internierungseinrichtungen 1939-1945* (Mattiello and Vogt 1986) or, specifically for Baden-Württemberg, the *Heimatgeschichtlicher Wegweiser zu Stätten des Widerstandes und der Verfolgung 1933-1945* (Studienkreis Deutscher Widerstand 1991-1997) which briefly addresses various forced labour camps and their associated industries.

2.2 Initial research II: getting connected with local researchers and memorial initiatives

After the literature review, the next step was to establish contact with local memorial initiatives. In Baden-Württemberg there are currently sixteen initiatives engaged in active remembrance and political education at former Natzweiler camp locations (see list of memorial initiatives). Many of these initiatives have been researching specific camps and related industries for years or even decades (e.g. Brenneisen 2020; Huth 2013; Opfermann 2000; Scheck 2014). They have created extensive archives on these sites, have conducted fundamental research, and acquired significant knowledge about the local structures and spatial context of the Nazi era. Not least, these initiatives have created hubs where survivors, relatives of victims, locals, and young people can meet and commemorate the people who were exploited and murdered. But not every former Natzweiler subcamp has or has ever had an active memorial initiative.

The support by these associations and dedicated local researchers has been most essential for the success of the Natzweiler project. Without their willingness to share their knowledge and participate in joint site surveys, the depth of documentation and evaluation achieved on certain aspects of the concentration camp system would not have been possible (Hausmair and Bollacher 2019). This aspect cannot be emphasised enough because archaeology does not always encounter such cooperation. Sometimes, local researchers may view government agencies or academic researchers as competition or, conversely, there may be no adequate appreciation for local research from the authorities or academic institutions.

Fortunately, our experience was a largely positive one: the collaboration and support offered by memorial initiatives and local researchers has invaluably enriched our understanding of the Natzweiler camps and considerably contributed to the evaluation of the remains of the concentration camp complex from the different viewpoints of heritage management, memory work and archaeological research. The mutual exchange of knowledge and insights has fostered a more comprehensive and nuanced approach to the study of these historical sites.

2.3 Source research: identifying relevant archives and primary sources

With the knowledge gained from the initial research, targeted searches for primary sources and additional information were conducted in private and public archives, ranging in scope from regional to international. The aim was to further supplement the understanding of historical specifics, spatial structures, and developments of individual camp complexes. Sources containing spatial information such as plans, sketches, photographs, and location descriptions were of particular, though not exclusive, interest. Searching for primary sources is a fundamental but time-consuming task. The research effort required for the project was significantly higher and in some instances beyond the available time and personnel capacities, particularly for sites where no local memory culture or historical research has developed.

2.3.1 Archival sources

A crucial aspect of gathering primary sources is to identify relevant archives. What sounds like 'business as usual' for trained historians, may become quite a challenge for historical archaeologists, since the archival landscape is enormous, each archive is structured differently, and finding aids vary in design and user friendliness. The time required to locate potentially relevant archives and familiarise oneself with different archival systems should not be underestimated. More importantly, the holdings of archives are strongly determined by their specific collection histories as well as administrative structures of the Nazi and post-war period.

Collections held by local memorial initiatives and local researchers are often copies of primary sources gathered from various local, national, and international archives during the their investigative work on specific camps and economic enterprises. These collections may include compilations of oral testimonies from former concentration camp prisoners and other eyewitnesses, as well as sketches and plans of camps or local sceneries, mostly post-war photographs, and administrative documents related to specific camp complexes. These archives have been of crucial importance to our project as they offered fast access to relevant sources. Searching them was not always a straightforward task though, since the organisation of different collections varied considerably and, in regard to source criticism, the origin of provided materials was often difficult to determine.

At the county and state level, some archives yielded documents relevant to the respective camp complexes, particularly providing information on the post-war

period. Archival holdings on post-war dismantling processes and restitution matters regarding land plots employed for the 'Unternehmen Wüste' (a project of the Nazi shale oil industry associated with seven Natzweiler camps, see Glauning 2006; Opfermann 2000; Zekorn 2019) can be found in the State Archives of Baden-Württemberg, in particular the branches based in Stuttgart and Sigmaringen, since the State of Baden-Württemberg played an important administrative role in these procedures. The archives of the State Office for Geology, Resources and Mining - as a specialised authority with significant responsibilities for active and decommissioned mines - contain documents related to underground facilities of the Nazi war industry which exploited Natzweiler prisoners for their ventures, such as the Daimler-Benz engine manufacture translocated into mines at Neckarelz (Huth 2013; Markowitsch and Zwick 2011) and Haslach/Kinzigtal (Fuß 2001), or the mines at Kochendorf (Riexinger and Ernst 2003) and Neckargartach (Rautnig 2007) that were adapted for the relocation of factories of various arms and aircraft manufacturers. In some cases, communal archives held documents related to building applications for prospective camps or post-war materials concerning the sale and destruction of camps. It is therefore useful to consider the administrative structures of the Nazi era and responsibilities for building permits or specific economic or technical areas at that time, as the respective successor authorities may house historical records concerning the approval procedures for the construction of camps or war economy projects.

On a national level, the Federal Archives (Bundesarchiv) in Berlin-Lichterfelde were particularly significant, as they contained archival material from state organisations (e.g. the Organisation Todt, a civil and military engineering organisation of the Nazi regime that was involved in the construction of most subcamps and armament factories, see Dick 2021) or state-owned companies that were active in various camp complexes, like the Deutsche Ölschieferforschungs-Gesellschaft (DÖLF, a company specifically founded for the shale oil project 'Unternehmen Wüste'; Walther 2018). The Bundesarchiv also holds administrative documents from the Nazi period that provide insights into the planning of the relocation of strategically important companies into mines and tunnels across the Reich ('Untertageverlagerungen'/'U-Verlagerungen') in order to shelter them from allied bombing raids (a topic that became paramount for the project since several Natzweiler camps were established for such relocations. However, even though a few of these sites have been intensively studied from a historical perspective (see Markowitsch 2018; Metz 2022), the topic as a whole remains surprisingly under-researched. The Federal Archives' branch at Freiburg holds the materials related to Germany's military forces, which becomes of particular interest when researching prisoner-of-war camps or contexts where the Wehrmacht played a role. The archive of the Zentrale Stelle Ludwigsburg (Germany's central agency for investigating Nazi war crimes, whose archive is managed by the Bundesarchiv as a branch) provided access to documents related to war crimes trials, some of which included testimonies about specific crimes committed within the Natzweiler system, information about the temporal development and spatial organisation of individual camps (including sketches), such as camp Echterdingen. Knowledge about post-war jurisdiction proved helpful for conducting targeted searches for specific camps. However, it should be noted that Ludwigsburg is the archive of a still-active agency for the prosecution of Nazi crimes and certain archival material may therefore be subject to

access restrictions. Conducting recurring archive research at Ludwigsburg at appropriate intervals would therefore be beneficial.

Further important materials could be located through the online collection of the Arolsen Archives (formerly known as the International Tracing Service). Arolsen certainly can be described as the world's central and most extensive archive on people persecuted under National Socialism. Currently, the archives run an enormous digitisation project based on crowd-sourcing (#every name counts), which eventually should grant everybody unrestricted access to their holdings. For the Natzweiler project, Arolsen proved particularly helpful in obtaining more information about the victims: deportation lists and lists of victims' names put the focus back on the people who had to suffer at the investigated sites, and provided important information about mass graves and burial sites of murdered concentration camp prisoners that were collected in the post-war period, and occasionally, sketches and building plans of individual camps.

Last but not least, allied archives are also of great relevance. The United States National Archives and Records Administration (NARA) in Washington DC offers many of its materials as digital content and searchable online. It includes various post-war administrative records on different Natzweiler camps, related war trails, and WWII aerial reconnaissance (see 2.3.2). French archives are of particular interest for research into Natzweiler camps. Not only was the Natzweiler main camp located in occupied territory in France, and many French nationals were imprisoned in Natzweiler and its subcamps, France also became the occupying power in Baden-Württemberg after the war. As a result, the French administration produced a considerable body of documents on the handling of former Natzweiler camps in the post-war period and also initiated numerous exhumations of mass graves in Baden-Württemberg (on the French Tracing Service in general, see Dreyfus 2017). These materials can be found in the Archives diplomatiques/Ministère de l'Europe et des Affaires étrangères in La Courneuve, the Service Historique de la Défense/ Ministère des Armèes in Caen, or the Archives nationals/Ministère de la Culture in Pierrefitte-sur-Seine. Since the local memorial initiatives of the former Natzweiler subcamps had already conducted extensive research in French archives and provided access to these materials, further research was not carried out within the scope of the project. However, there is undoubtedly still significant potential for future research. In general, it is advisable to pay attention to post-war administrative structures of a research area in order to identify potentially important archives.

2.3.2 Historical aerial images

One of the key primary sources for the project was imagery from allied aerial reconnaissance missions which, in correlation with other image sources containing spatial information (blueprints, site plans, construction drawings, historical photographs, testimonies, sketches, and drawings from memory), served to identify exact localities of relevant sites. Aerial photographs of Baden-Württemberg were taken by units of the United States Army Air Force (USAAF) and the British Royal Air Force (RAF). The USAAF aerial photographs are generally archived in the National Archives and Records Administration (NARA) in Washington DC, with (rather few) flight series being available online and in the public domain. Duplicates of USAAF imagery are also held at the British National Collection of Aerial Photography

(NCAP) in Edinburgh, which also houses the collection of RAF images. However, the Baden-Württemberg State Office for Geoinformation and Land Development (LGL) has analogue copies of the USAAF imagery of Baden-Württemberg, usually used for the Explosive Ordnance Disposal Service's hazard analysis. Many other state surveying offices in Germany likewise hold duplicates of allied imagery of their respective states. Belonging to the same state administration, our project could directly access analogue stock of photos held by the LGL, screen the images and then select relevant frames for digitisation and further processing in the project's GIS. Additional searches were made in the online archives of NARA and NCAP.

It should be noted that fees are applicable for the data offered by LGL and NCAP. Digital content provided by NARA is in the public domain and cost free. The LGL, for instance, bills the work for digitising images. To access the full search services of the NCAP online collection, an annual fee has to be paid. Additional fees apply for every image purchased in high resolution. Compared to the services given by commercial providers of allied aerial photographs, who are often sought by projects on the archaeology of the Nazi period or WWII, the approach of the Natzweiler project had one significant advantage: images could be screened for relevant information before paying any fees. Purchasing aerial imagery from commercial providers usually has to be done 'blindly'. The possibility to independently examine the analogue photos and only then specifically purchase relevant frames as digitised copies is budget-friendly. It also allows the exploration of image content that would otherwise remain unnoticed, or to determine relevant temporal developments within a camp complex and its wider surrounding by screening photo series from different flight dates.

2.3.3 Archival obstacles

The critical examination and analysis of the collected sources allowed for locating most sites precisely and enabled in-depth insights into organisational structures, events and developments within each camp complex, which were crucial for determining and accurately designating areas of historical interest. However, there were also several obstacles and problems we encountered during this research process. As is generally known, searching primary sources is not like going through a 'facts collection'. Rather it is a slow and difficult task of gathering, comparing and critically assessing information and then determining the reliability of the information.

Noticeably, there was considerable diversity regarding details of information for different camp complexes, and in general a rather patchy transmission of administrative records and documentary materials. With few exceptions, no official construction plan could be located for any of the Natzweiler camps in Baden-Württemberg, while post-war sketches of camps' layouts drawn by survivors or perpetrators could be determined for several camps. The availability of primary sources varied widely from one camp complex to another, partly because of the deliberate destruction of administrative records by Nazis towards the end of the war. At Bisingen for example, it is known that in 1945, just before the arrival of the Allies, the camp management and the mayor of the town extensively destroyed records. Much documentary material, in particular on economically or technologically relevant Nazi projects, is also thought to have been taken abroad by the Allies in the post-war period (see e.g. Hausmair 2020, n.5). Further post-war loss of significant primary sources certainly occurred through the destruction of documents, either through

official orders with the intention of covering up criminal events or through careless actions of responsible administrators.

Another obstacle was the content of the records produced by Nazi administration itself. In addition to the different spelling of individual camp names or even the use of different names for the same camp, the identification of certain camps as subcamps of Natzweiler or as labour commandos attached to another subcamp within the Nazi administrative system proved to be difficult. For example, KZ Sandweier was determined in some records as a subcamp of KZ Iffezheim, while Neunkirchen was categorised in some Nazi records not as a camp but as a work site, as only a few concentration camp prisoners were housed there permanently (see Brenneisen 2020, 640-42; Huth 2013, 47-48). Regardless of the inconsistencies about the designation of these sites as subcamp, labour commando, or work site, we recorded them for the project, since all these locations were places of deportation and forced labour.

Moreover, some camps that were listed as Natzweiler subcamps in historical publications (Benz and Distel 2007; Megargee 2009) could not be located or their existence verified owing to a lack of sufficiently reliable sources confirming their actual completion or occupancy by concentration camp prisoners (e.g. KZ Neckarzimmern, KZ Neuenbürg-Eyachtal, KZ Mannheim-Waldhofen; see also Zegenhagen 2009, 1053).

All the gathered information was critically assessed following basic principles of historical source critique (internal, external and comparative source criticism; see Budde 2008, 66-68). Not only can administrative records as well as oral histories or visual sources be fragmented and patchy, they are inherently subjective products of their creators and thus representations of different perspectives on the historical contexts under investigation. They may even contain wilfully wrong information (Bernbeck 2017, chapter 2). For the historical-archaeological analyses (see below), Anders Andrén's (1998) fundamental work on the linkage between different kinds of historical sources (association, correspondence, contrast; see also Schreg 2007) was employed as a guiding principle.

2.4 Localisation/spatial analysis/identification I: reconstructing historical spatial structures

All relevant sources for the project were digitised and systematically recorded in the project database, allowing for quick access. References to source collections that could be relevant for future research were also included. Based on the collected data, an overview could then be created not only of how many subcamps were located in the research area but also of their connections to associated forced labour facilities and infrastructures. This data collection formed the basis for the next stage of the workflow - the exact location and spatial reconstruction of camp complexes through the systematic correlation of spatial data from historical aerial photographs and sources with modern geodata.

The historical aerial photographs and available historical plans and maps were georeferenced as individual raster files in the project GIS. In selected cases, Ralf Hesse/LAD processed a series of aerial images into large-scale aerial panoramas to reconstruct entire historical landscapes (see Figure 5; for the underlying methodology Sevara *et al.* 2018; Stichelbaut and Cowley 2016). The maximum extent of single features (such as barracks), individual sites (e.g. underground factory) and connecting infrastructure of sites belonging to the same camp complex were mapped and linked to historical information from the project database. This information was then used to create larger polygons circumscribing the outline of an entire camp complex.

Figure 5: Top: Aerial panorama of the military airport at Hailfingen including the KZ Hailfingen, a forced labour and a prisoner-of-war-camp, a mass grave, various hangars, rollways, construction sites, quarries and connecting roads, spanning a distance of over 5.5km, 18 April 1945 (photograph: USAAF © KMBD, LGL; orthomosaic processing: R. Hesse/LAD). Bottom: Overlay of modern orthophoto with the mapped outline of camp complex Hailfingen (orange) and individual sites and features (purple) (mapped data: B. Hausmair; geodata: © Geobasisdaten LGL)

Historical aerial photographs are commonly used to identify sites of historical significance (Spennemann 2012; Sturdy Colls 2015, 132-35). Structures of barrack camps can be identified based on typical closed barrack formations, fence and wall enclosures, guard towers, and associated infrastructure (e.g. firewater ponds). To securely assign historically known camps or workplaces to sites identified in aerial photographs, a comparison was made with sketches, blueprints, oral testimonies and the results of the literature search. This comparison was necessary because industrial sites sometimes had multiple forced labour camps attached to them (e.g. Hailfingen; see Figure 5), Erzingen or Wasseralfingen), or concentration camps were established within existing forced labour camps (e.g. KZ Geislingen or Ellwangen II). In some cases, camps were not built as barrack camps, but put into existing buildings such as schools (e.g. KZ Neckarelz I or KZ Mannheim-Sandhofen), industrial buildings (e.g. KZ Calw), hangars (e.g. KZ Echterdingen or KZ Hailfingen), or underground facilities (e.g. complex Haslach/Kinzigtal), emphasising the need for source research to correctly identify camp structures in aerial photographs.

The precise dating of historical aerial photographs and multiple flyovers of camp complexes enable diachronic analyses of spatial changes during and sometimes also after the Nazi period. This allows the investigation of the establishment and expansion of camps, road networks, industrial facilities, and mass graves over time, and also identifies the dismantling or intentional concealment of traces before the arrival of the Allies (Figure 6).

Taking all this information together and exploring it in spatial and temporal dimensions enables insights into the planning, gradual adjustments, and deviations from original plans for camps and forced labour sites. At Asbach, for example, three diverging camp plans were drawn and adapted within a year, although none of them matched exactly with what was eventually built on the ground.
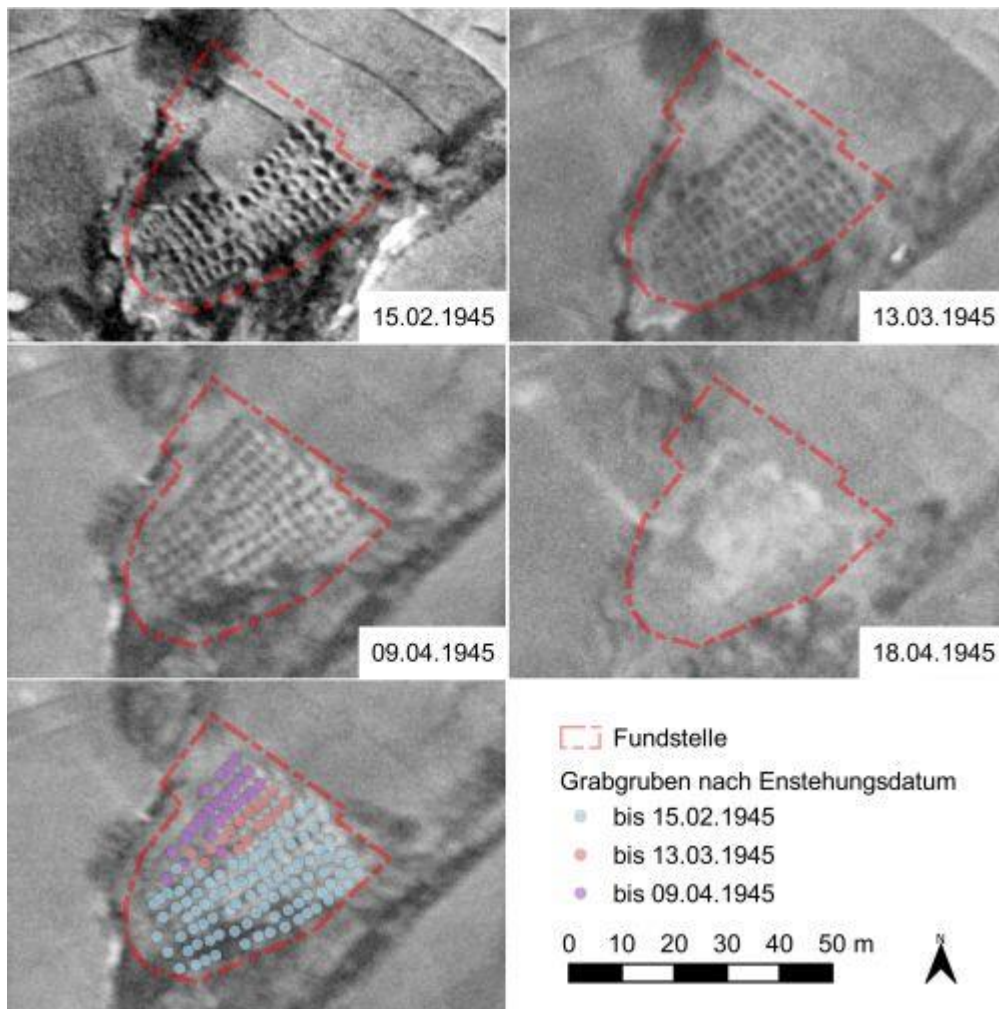
Figure 6: Burial pits of the mass grave of KZ Dautmergen photographed by allied aerial reconnaissance on different dates. The images between 15 February and 9 April 1945 show that the mass grave continuously grew, thus reflecting the high death rate of the camp. The image from 18 April 1945 shows only a blurred area, indicating that the SS levelled the mass grave before abandoning the camp in order to wipe the traces of their crimes (photograph: USAAF © KMBD, LGL, mapped data: B. Hausmair)

Aerial surveys also enable a vital reconstruction of site layouts where no archaeological preservation can be expected owing to modern construction activities. The site of KZ Spaichingen, for instance, has been completely overbuilt in recent decades and no detailed plans of the camp are known. Aerial images taken between November and April 1945, however, depict different construction phases of the camp, with the one taken in November 1944 exposing even the internal structure of three barracks, as it was taken at a time when the buildings had yet to be roofed (Figure 7).
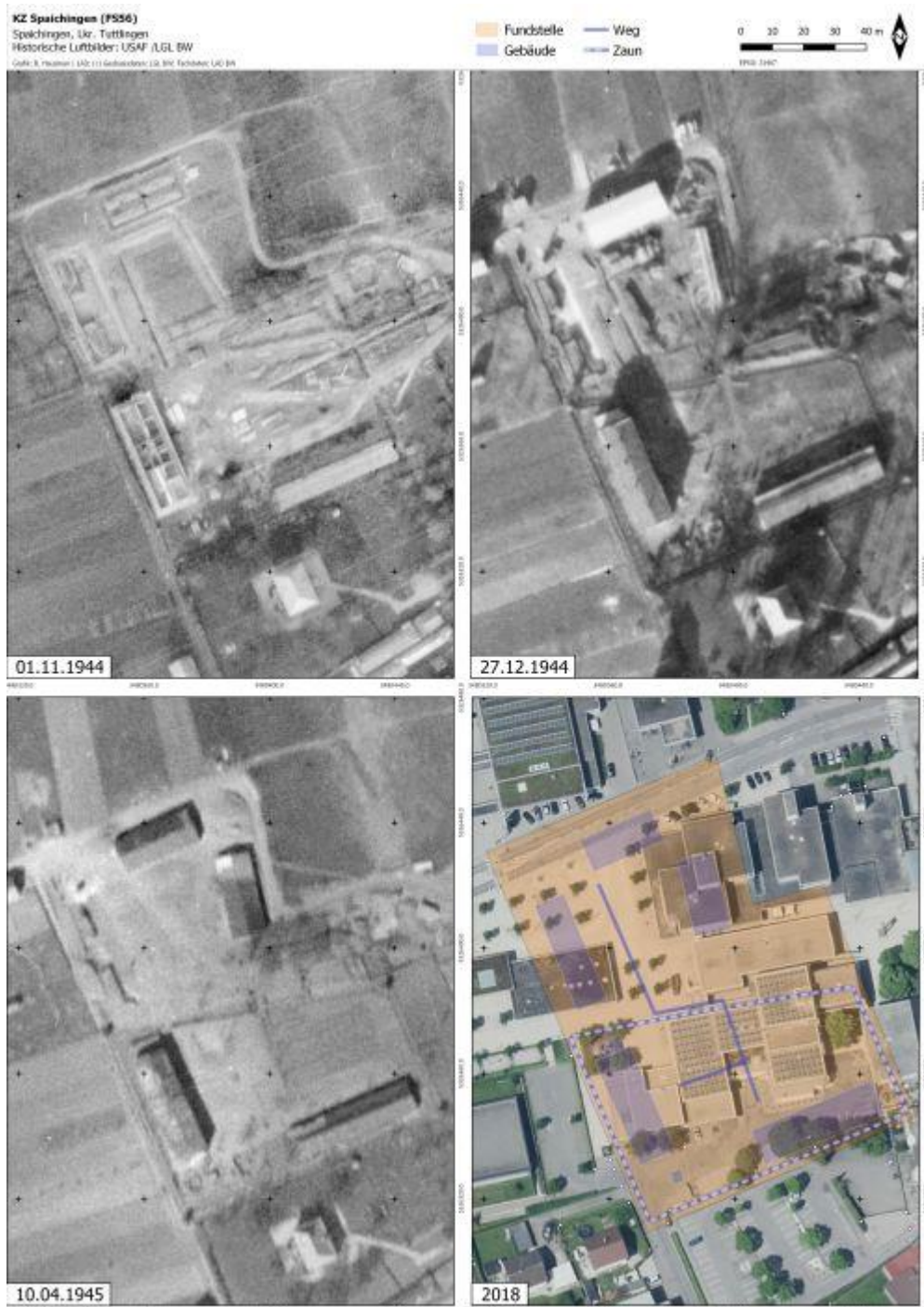
Figure 7: Aerial images of KZ Spaichingen during different construction stages (photograph: USAAF 1944-1945, © KMBD, LGL) and the overlay of the modern, completely overbuilt area with the camp layout (mapped data: B. Hausmair; photograph: © Geobasisdaten LGL)

Some sources such as non-georeferenced maps drawn from memory by former prisoners or camp personnel, post-war photographs and descriptions of camp locations can provide new perspectives and insights into camp structures that may not be evident in aerial photographs or perpetrator plans, as they help to identify the function of different camp buildings. At the same time, such sources also reveal the challenges of using memory sketches and oral histories, as they may sometimes differ in details from each other or even from historical aerial photographs, as the

comparison of two post-war memory maps of KZ Dautmergen and historical aerial imagery demonstrates (cf. Figures 8, 9 and 10).
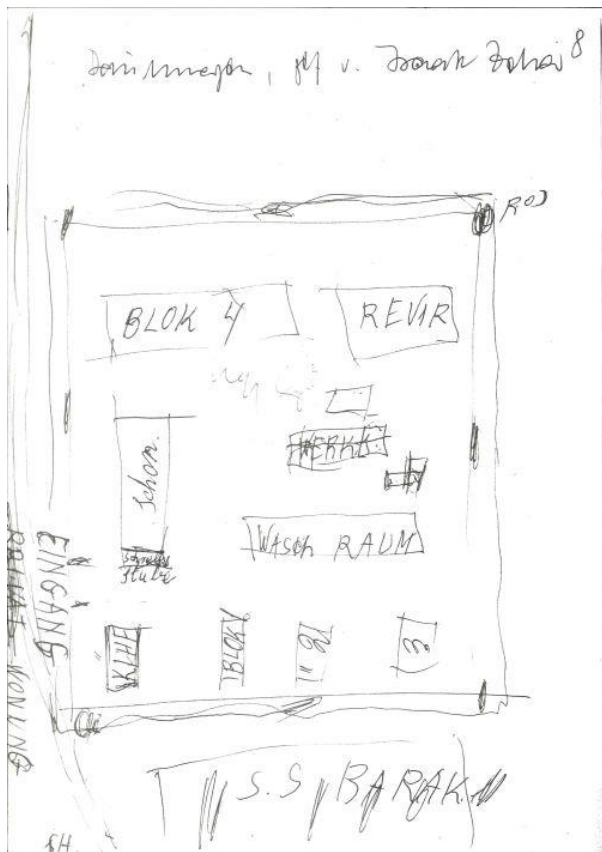

Figure 8: Sketch including functional description of buildings of KZ Dautmergen, drawn by survivor Isaak Zohar in 1961 (Kreisarchiv Zollernalbkreis, Balingen, SaUW31)
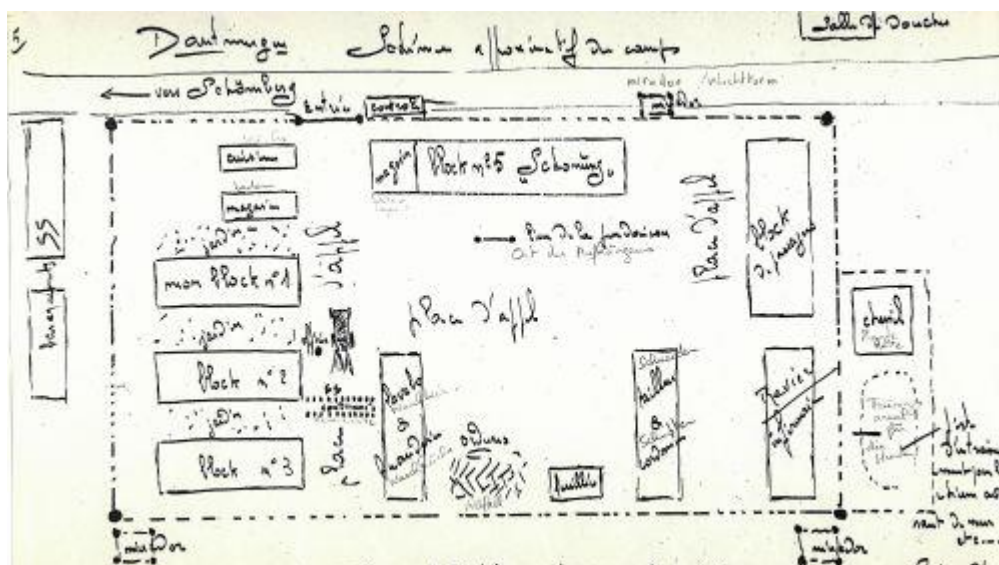

Figure 9: Sketch including functional description of buildings of KZ Dautmergen, drawn by survivor Ludovic de La Chapelle (Kreisarchiv Zollernalbkreis, Balingen, no signature)

Figure 10: Aerial image of KZ Dautmergen from 13 April 1945 (photograph: USAAF, © KMBD, LGL; mapped data: B. Hausmair), and the area in 2016 with the overlay of the camp layout (mapped data: B. Hausmair; photograph: © Geobasisdaten LGL)

2.5 Localisation/spatial analysis/identification II: identifying (potential) material remains

After georeferencing, mapping and interpreting the historical spatial sources, the comparison with modern geospatial data and post-war aerial photo series was used to identify potentially preserved features or archaeological areas of interest, as well as modern ground disturbances and large-scale landscape changes resulting from different Nazi ventures. Current orthophotos, satellite images, digital terrain models from LIDAR data, and administrative boundaries (all provided by © Geobaisidaten/LGL) can help to identify above-ground structures and features that may still exist. In some cases, this allows for the identification of the continuity of camp buildings or the remains of structures such as barrack platforms and remnants of industrial facilities. In specific instances, archaeological features were detected through anomalies in vegetation patterns in modern aerial images, as seen in the case of KZ Kochendorf. Furthermore, the comparison of historical and modern geodata exposes large-scale and long-term alterations of local landscapes. At the shale oil factory Wüste 4 near Erzingen, for instance, the quarry where the shale rock had to be extracted by concentration camp prisoners and prisoners of war is clearly visible on the aerial photo from 1945. After the war, the site was abandoned and the open-pit quarry backfilled and levelled. Modern airborne laser scanning (ALS) terrain data, however, clearly shows a large-scale depression in the modern surface caused by the backfilled quarry (Figure 11).

Figure 11: Comparison of historical and modern geodata (orthophoto and digital terrain model) of the site of shale oil factory Wüste 4, Erzingen, showing a persisting large-scale terrain alteration caused by the backfilled quarry (top: photograph: USAAF, 2 February 1945, © KMBD, LGL; middle and bottom: © Geobasisdaten LGL)

As an important source for understanding the post-war treatment of relics from the Nazi period, a series of aerial photographs from 1968, which were taken from the entire State of Baden-Württemberg and which are publicly accessible, also proved invaluable. This photo series allowed for a more precise temporal resolution of recultivation, reconstruction, and dismantling processes of camps and industrial facilities and, in some cases, served as a critical examination of our current state of

knowledge. For example, modern aerial images of the former forced labour camp Hohl, a barrack camp of the camp complex Neckarelz, show an undeveloped green area, suggesting high potential for the preservation of archaeological remains of the camp. However, the 1968 aerial photograph reveals that at that time the current open area was occupied by an industrial hall, which has since been demolished and removed (see Figure 12). This finding led to a re-evaluation of the potential state of preservation of remains of the camp.

Figure 12: Forced labour camp Lager Hohl, Neckar-Odenwald-Kreis. Comparison of aerial photographs from 1945, 1968, and 2015 (top: USAAF, © KMBD, LGL; middle: LeoBW/LGL; bottom: © Geobasisdaten LGL; mapped data: A. Dészi)

In the area of KZ Schörzingen, geomagnetic surveys were conducted by the LAD, but did not yield any evidence of archaeological features. The geomagnetic survey area displayed strong disturbances in the 1968 aerial photograph, which likely point towards the destruction of potential remains in the 1960s and explain the negative survey results.

Camps originally located in forests or narrow valleys pose particular challenges for analysis via historical aerial photographs (e.g. KZ Asbach or forced labour camp Kochendorf-Plattenwald) because the tree cover obstructs the view. The precise locality and delimitation of forced labour sites in forested areas, ravines or underground facilities, such as the aircraft assembly halls at Hessental or Neuenbürg-Eyachtal, or industrial facilities relocated into mines (e.g. Kochendorf, Neckarelz or Haslach/Kinzigtal), can only be done to a limited extent based on historical aerial photographs, since the site's location was chosen to hide them from allied reconnaissance.

A particular challenge for the project was also the identification of mass graves associated with the respective camp complexes. Although most mass graves of the Natzweiler concentration camp system were exhumed by the French Tracing Service shortly after the war (see Dreyfus 2017) and burial sites of Nazi victims legally do not fall under the responsibility of heritage authorities in Germany (see Janz 2018, 226-49), there are still a few cases where the historical locations of the mass graves could not be determined, or the complete exhumation could not be reliably confirmed and documented (at KZ Hailfingen and Dormettingen). From the perspective of the authors, the sites of exhumed mass graves should be considered for heritage protection, on the one hand out of respect for the victims, and on the other because it cannot be taken for granted that all human remains were recovered in the framework of early post-war exhumations, as evidenced by the recent example of the incompletely exhumed cemetery for Soviet prisoners of war in Bremen-Oslebshausen (see Halle and Hähn 2023). Therefore, enquiries were made of police stations and authorities to check whether there were any reports of bone findings from relevant plots that could indicate the presence of an undocumented burial site. These inquiries have yielded no 'positive' response to date.

Despite these numerous challenges, the integrated analysis of different kinds of sources made it possible to successfully identify and locate all historically confirmed Natzweiler subcamps in Baden-Württemberg, as well as the majority of associated workplaces and mass graves. Altogether, we recorded 47 concentration camps (including 38 subcamps of Natzweiler, 6 subcamps of Dachau and 3 early concentration camps), 21 mass graves, 16 cemeteries (erected in the post-war period for reburying the remains of victims exhumed from mass graves), 60 sites of forced labour (industrial sites, underground industrial facilities, construction sites…) and 40 other camps (including forced labour camps, POW camps, and subcamps of *Sicherungslager* Rotenfels-Gaggenau).

2.6 Fieldwork

2.6.1 Fieldwork I: non-invasive investigations

Identified areas of interest were systematically examined via on-site inspections. The goal was to record both above-ground architectural remains and potential sub-surface features, which could be suitable for further prospection or invasive field research. Publicly accessible standing buildings, ruins and land plots were visited, and permission was obtained to access private properties. In most cases, residents and property owners were interested in the conservation efforts, and access was granted without difficulty. In a few instances, access permission was not granted, making it impossible to conduct investigations during the project's duration.

During the site visits, conversations with local residents and individuals familiar with the area about the identified features proved to be very valuable. This approach included locals in the production of archaeological knowledge, and in many instances provided us with additional insights into nearby features and the post-war utilisation of buildings that were previously unknown and not visible in aerial images. In cases with well-preserved architectural remains, the expertise of colleagues from the architectural heritage preservation department of the LAD was sought.

The spectrum of identified architectural remains includes; a few buildings from former camps (e.g. still-used barracks in KZ Neckarelz II, KZ Bisingen and Neckarbischofsheim or solid structures of the camp commandant's office of KZ Schömberg); isolated remnants of technical facilities from former industrial sites (e.g. transformer houses, oil tanks and infrastructure of the 'Unternehmen Wüste', see Hausmair 2020) or construction crane foundations and track systems from the 'Stoffel' construction site in Vaihingen/Enz (Kallen 2019); entire building ensembles that have undergone varying degrees of alteration following renovations and change of use (e.g. hangars at the airports in Echterdingen and Schwäbisch Hall, factory buildings in Calw and Frommern); air raid shelters like the bunkers close to KZ Schörzingen or the forced labour and hospital camp Großsachsenheim (Bollacher 2023); or even active mines like Kochendorf and Obrigheim. Where possible, these locations were documented during the fieldwork through photography or 3D laser scanning, and the resulting models were made publicly available (e.g. shale oil factory Wüste 10 near Zepfenhan or the underground industrial facility Vulkan/Haslach).

Stollen an der Gedenkstätte Vulkan, Haslach i.K. by LAD BW on Sketchfab – ONLINE ONLY

In areas where former camps and workplaces were completely demolished, numerous above-ground archaeological features have been preserved, such as foundations of barracks (e.g. KZ Asbach, see Dézsi *et al.* 2022) or forced labour camps Kochendorf-Plattenwald or Neuenbürg-Eyachtal) or topographic anomalies resulting from former platforms for barracks, military installations, water ditches, and pathways, or extensive landscape changes created by quarries or industrial ventures (e.g. oil shale piles). These features also include traces of post-war handling of the terror sites, such as levelling, debris piles with parts of barracks (KZ Sandweier or camp Großsachsenheim), 'recultivation' of industrially used areas, or the continued

use of barrack platforms and camp fences in private gardens today. These remnants were mapped and photographed on-site.

Based on the on-site inspections, selected locations with minimal disturbance or remaining features were subject to geophysical surveys or walking surveys to gain further insights into the actual preservation of archaeological features. In total, nine investigations using ground-penetrating radar and/or geomagnetic devices were conducted at locations of former Natzweiler subcamps. The results of the surveys provided detailed insights into the sub-surface remains of barracks and infrastructure in some cases, for example in Bisingen (Hausmair and von der Osten 2019), Kochendorf, Hessental, Neckargerach and Dormettingen. In most cases, the results of the geoprospections indicate the likely preservation of sub-surface features. In Asbach, owing to the challenging access caused by forest growth, a walking survey was conducted instead of geophysical surveys (Dézsi *et al.* 2022). Additionally, a collaboration project with Lukas Werther and students from the University of Tübingen allowed for a more detailed examination of the shale oil factory Wüste Werk at Engstlatt, based on data from Karl Kleinbach's long-term systematic surface surveys. Kleinbach is a local researcher and a member of the local memorial sites of the 'Unternehmen Wüste' (Biesenthal *et al.* in press; Blum *et al.* 2023, 74-79).

2.6.2 Fieldwork II: invasive investigations

Owing to the extensive historical research on the Bisingen concentration camp and the 'Unternehmen Wüste' (Opfermann 2000; Glauning 2006; Walther 2018; Zekorn 2019), as well as the positive results from the geophysical survey at the partially undeveloped area of the camp (Hausmair and von der Osten 2019), a research excavation was conducted in Bisingen in 2019 to gain specific insights into the preservation of archaeological features in a camp that can be understood as a representative case of the mostly very late and sometimes only provisionally constructed camps of the Natzweiler concentration camp system (Hausmair and Bollacher 2020; Hausmair and Trixl in press). Additionally, in collaboration with the University of Tübingen, the shale pile of shale oil factory Wüste 4 was subjected to geochemical sampling and analysis to explore the technological processes of oil production (see Berthold *et al.* in prep). The initial results from these invasive measures provide a promising foundation for future field research in the context of academic projects. However, invasive field research is by far the most time-, personnel-, and cost-intensive archaeological measure, so within the scope of the project, activities were limited to the investigations described above.

During the project duration, there were also several archaeological investigations mandated by the LAD as part of construction projects. These excavations were carried out by the LAD or archaeological firms and were sometimes made possible or at least supported by the work of the project team, as project data and results were promptly provided (e.g. Bollacher 2023; Hausmair and Bollacher 2020).

2.7 Heritage conservation and archiving

After the individual concentration camp complexes were documented, the geodata of historically relevant areas, along with the collected research data, was migrated to the official monument registry (ADAB) and designated as 'test cases for heritage protection' ('Prüffall'). The members of the LAD's inventory department then assessed the monument status from a legal perspective and, if possible, registered identified sites as heritage sites, consulting the project team responsible for advice. The goal of this continuous information exchange between the project and the inventory department, as well as the continuous transfer of relevant data to the official monument registry, was to get project results into the official system as quickly as possible and thus enable immediate responses to potential threats to the sites as a result of modern construction activities. However, as is the case with many other protected monuments from different periods and contexts, there were also a few instances of unauthorised destruction of registered heritage sites e.g. Dormettingen and Neckarelz II.

During the project duration, generated datasets were also made available for external research projects, exhibitions, and memorial initiatives. In cooperation with memorial initiatives, several public talks and some public archaeology events were held during and after fieldwork. A print and online publication with contributions by project members and other persons involved in the research and memorial work related to the Natzweiler camps is currently in preparation and will present the most relevant project results, including a catalogue of the investigated sites to a wide audience (Bollacher *et al.* in prep). In addition to adequate internal long-term archiving of the complete project data, further avenues to allow public accessibility to the project data still need to be found. One possible approach could be to develop an interactive online map with historical and archaeological information about the concentration camp complexes, as well as references to memorial initiatives, that can be freely accessed and queried by users. The project database and GIS certainly provide an ideal basis for making the collected information available to the public in a useful way.

3. A successful workflow? Conclusion

The workflow developed for the Natzweiler project can be considered as a methodically coherent and successful approach that resulted in a state-wide and systematic recording of the Natzweiler subcamps, associated mass graves, cemeteries, and sites of forced labour. It generated a substantial database of diverse historical and archaeological sources related to these NS terror sites and landscapes in Baden-Württemberg, enabled discussions within the LAD about previously neglected aspects of the violent history of the 20th century and allowed a discourse to be initiated on the assessment criteria for relics of the Nazi past.

The workflow can easily be used as a template for inventory projects in other federal states or countries, or be further adapted for specific research projects (Figure 13). The Natzweiler project should thus be understood as a methodological contribution to the further development of contemporary archaeology and monument

preservation at sites of modern mass violence. We advise a thorough discussion of the actual goals of a prospective project to be included as starting point of the workflow, since specific aims determine the necessary depth of source research and analyses and thus the resources of time and personnel needed to successfully conduct a project. As with all research designs, the stages of the workflow are not isolated but should be constantly evaluated and considered as parts of a reciprocal circle, where one will need to go backwards and forwards and be willing to adapt procedures depending on the outcome of individual stages.
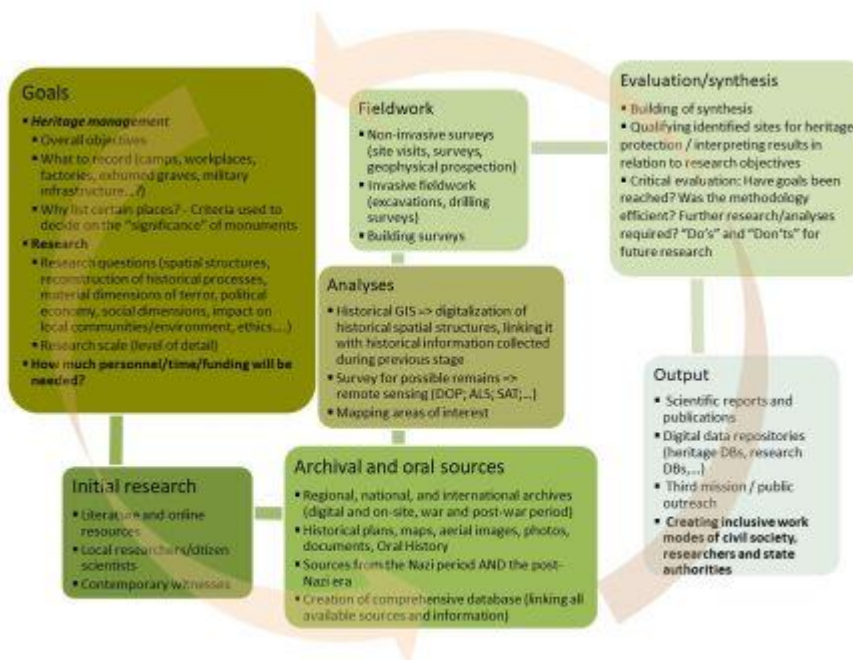

Figure 13: Scheme of the developed workflow (B. Hausmair)

Nevertheless, some critical reflections of parts of the workflow are also required. The final decision on the qualification of individual sites as listed monuments did not fall within the competence of the project team. A more comprehensive system for assessing sites' historical significance - in addition to their symbolic value for remembrance - as a prerequisite for heritage protection will need to be developed through further discussions following the Natzweiler project. This includes reflections on the relationship of heritage management of standing buildings and archaeology. In most European countries, the heritage management of buildings and archaeological sites is facilitated by different departments (for a critical assessment of this distinction see Baeriswyl 2000; Müller 2013, 75-76). Criteria for putting buildings under heritage protection follow different principles than when handling archaeological sites, sometimes leading to the situation that buildings are not being listed, but once they are torn down, their locations are put under protection as archaeological sites. During the project, a dialogue with the department of heritage management of buildings was initiated, resulting in co-conducted investigations of standing industrial and residential buildings and intensively discussing the parameters for heritage protection from both disciplines' perspectives. Handling monuments related to recent mass violence, however, also requires ethical

considerations that go beyond discipline-specific criteria for heritage protection. The impact of heritage protection on owners of standing buildings is certainly different from that on owners of archaeological sites, since it can directly affect someone's living and workplace through the possible intrusion of owners' privacy once listed buildings are made publicly known. Owners' reactions to heritage protection ranged between openness, interest and sharing the post-war building history, to rejection or fear of intrusion of possible dark heritage tourism into their homes. A general reflection on handling inhabited buildings of former concentration camps is needed in regard to these ethical concerns.

From our perspective, the criteria to list identified sites of Nazi terror as registered heritage sites will also require further discussions. Currently, decisions are often based on vague considerations of 'memory politics'; while camps are conceived of as central places of victims' suffering and therefore 'more easily' qualified as listed monuments, remnants of industrial facilities or sites from where the perpetrators organised their crimes are less focused in victim-centred heritage approaches, as their evocative potential for memory discourses seems limited or difficult to convey to the public (see examples in Kersting 2020b). In our view, these criteria will need to be expanded in the future. Both authors had the privilege to conduct research within the Natzweiler project that went far beyond the actual goals of creating an inventory, research on terror sites as parts of cultural landscapes or the entanglement of state terror, the suffering it caused for millions of people, and capitalist war economies. The project results demonstrate that the materialities of Nazi terror are extremely complex, and isolated investigations into single camp sites or strictly differentiating sites into victim and perpetrator sites or sites of state terror and sites of military history is inappropriate. The close interconnection of state organisation, war industry, forced labour, technological development, and mass death creates a multifaceted landscape of terror. Equally, military infrastructures or battlefields as remnants of military war history should not be considered disconnected from the catastrophe of mass abduction, forced labour and mass murder through state terror. An incautious enlistment of WWII remains, including military installations such as bunkers and tank ditches, may run into ethical problems if it reduces the focus on remembrance of victims for the sake of a more general war history. Not only would this disguise the entanglement of war and state terror, but it may also unintentionally serve audiences not interested in the latter and promote a war history detached from the suffering and deaths of victims of the Nazi regime.

The impact of Nazi terror on the material record did not cease in 1945. There are many instances of long-term impact on regional structures and the environment, such as durable changes in topography or parcelling, the post-war reuse of camps as housing for marginalised social groups, or environmental damage caused by armament projects. It actually created a landscape of destruction formed through Nazi persecution and forced labour that left lasting imprints on entire regions (Hausmair 2020). Heritage authorities will need to find ways to appreciate and handle these diachronic cultural landscapes and complex entanglements - a tough task within a greedy and capitalist economy that craves for ever more growth and expansion of infrastructure.

Finally, we would like to address the relationship of heritage authorities and 'the public'. 'Heritage' is not a natural entity. It is a cultural construct resulting from

processes of assigning meaning to remnants of the past and thus entangled in current social and political discourses (see e.g. Díaz-Andreu 2007; Lähdesmäki *et al.* 2019). Heritage protection represents states' or transnational political entities' legal power over defining historical remnants as significant and thus worthy of state protection 'in the public interest'. This legal power ideally should serve the long-term preservation of socially, culturally or artistically important traces of the past. Defining what is important is, in itself, a delicate and ambiguous matter, but even where societal consensus about 'significance' may have been established, heritage protection bears the risk of creating a dissonance between the interests of different actors participating in heritage-making. For instance, while putting sites of Nazi terror under protection should be seen as a support for memorial initiatives to preserve the materiality of historical places and thus material memories of victims' suffering, heritage protection certainly also impacts on the possibilities of interaction with these sites. In the case of the subcamp Vaihing/Enz, the foundations of the disinfection barrack were excavated by volunteers of the local memorial initiative in the late 1990s/early 2000s, at a time when heritage authorities did not consider such places as monuments. The foundations subsequently were transformed into the centrepiece of today's memorial (Scheck 2014, see also Hausmair in press). One could argue on the one hand that the excavation without archaeological supervision led to the loss of important archaeological information. On the other hand, it is questionable if the memorial as it stands today would ever have come into existence if its planning and construction had been determined by measures mandated by heritage legislation. In the case of KZ Neckarbischofsheim, the owner and current resident of a barrack that used to be part of the camp preserved an inmate's graffiti, which was hidden on the ceiling, when renovating the house some years ago. Another property owner preserved a standing toilet house of a camp in Neckarzimmern. These are in fact examples where 'heritage management' was facilitated by home/property owners themselves without any intervention of the state because people recognised these records as historically significant long before the state did.

This is of course not a general situation. That is why heritage authorities can (and should) actively foster historical awareness and appreciation by promoting more opportunities for community or public archaeology. During the Natzweiler project, public archaeology events were held by the LAD, e.g. during and after an archaeological survey at former KZ Asbach. These events gave locals the opportunity to engage with the remains and history of the site. Younger generations who did not know about the camp at their doorsteps were offered the opportunity to learn about local history, and older generations talked for the first time publicly about encounters they had with prisoners or how they had perceived the crimes committed in their immediate surroundings. The event created a space for collective remembrance and motivated a local appreciation and revaluation of the site, which hopefully will support its future protection not only through legal measures but also the conscious and careful engagement of local people with it (Dézsi *et al.* 2022; Dézsi in prep).

Appreciating 'heritage management from below' and fostering public engagement also holds the opportunity to deconstruct paralysing narratives of dark heritage and change them into open discourses about a painful past. Practising inclusive and sustainable modes of heritage management will be central, in our opinion, to ensure

the long-term preservation of former sites and landscapes of Nazi terror as places of remembrance of victims and spaces and places of learning about and from the past.

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