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Buraimi Oasis
Landscape Archaeology Project



Report on the 2014 Season

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Introduction

The Buraymī Oasis Landscape Archaeology Project (BOLAP) is a three-way collaboration between Zayed University, Sultan Qaboos University and TCA Abu Dhabi which aims to explore the historic unity and shared heritage of the Buraymī Oasis. The Buraymī Oasis, as described by Ibādī chroniclers and British explorers of the eighteenth to twentieth centuries, was made up of nine discrete date-palm oases, namely Hīlī, Masūdī, Qattāra, Jīmī, Hamāsa, Sarā, Muwajjī, Mutarid and al-Ayn (Fig. 1.1). However, our understanding of the origin and development of the Buraymī Oasis group has been obscured by the international border dividing the oasis into Emirati and Omani sections. Archaeological work has, since the mid-twentieth century, focused on the Emirati half of the oasis, culminating in the inscription of al-Ayn on the list of UNESCO World-Heritage Sites in 2011, with almost no archaeological work undertaken on the Omani side of the oasis. The *Buraymī Oasis Landscape Archaeology Project* was set up to redress this imbalance by commencing fieldwork in Oman. The first phase of fieldwork included a desk-based assessment coupled with remote sensing, which informed targeted geophysical survey undertaken by the University of Southampton, together with limited field walking and test pitting to provide ceramic dates. This paper will present the preliminary findings and discuss their contribution to the understanding of the origin and development of the Buraymī Oasis group.

The survey focused on the open area between the border fence and the ring road (Figs. 1.1 & 1.2), which together describe an angular ‘C’ shape, and may be divided laterally into three discrete areas:

- (i) The northern survey area (Figs. 2.1 & 2.2) consists of a series of low mounds, the less disturbed of these are covered by pot sherds and white pebbles, punctuated by a few ruined mudbrick houses and enclosure walls. Structural remains are more common to the east, where they are surrounded by twentieth-century housing of several periods, marking the transition to modernity. The archaeological remains of the eastern extent are being lost to the rapid encroachment of modern Buraymī, whilst the western extent has been impacted by dumping associated with the construction of the ring road in 2009.
- (ii) The central survey area (Figs. 3.1 & 3.2) consists of an empty plain of sparse desert scrub, crisscrossed by the remains of mudbrick enclosure walls and including a number of historic cemeteries, with surface ceramics found throughout. The area includes two historic cemeteries surrounded by modern walls, and the *thuqb* of the Qattāra Falaj can clearly be seen running diagonally across the northern extent of the plain. There has been remarkably little modern disturbance, although the area has recently been earmarked for development and divided into housing plots, with engineers laying out service trenches during our survey.
- (iii) The southern survey area (Figs. 4.1 & 4.2) consists of a mobile dune field encroaching on the remains of Hamāsa village but blocked by the seasonal flow of the Wādī Hamāsa. Away from the *wādī*, in the central extent of the dune field, more structural remains are to be found in association with surface ceramics. Much of the dune field has been overlaid by a street grid completed in 2009 to provide infrastructure for a housing development, creating a series of

insulae containing undisturbed areas of dunes, though these are now being machined away to provide level building plots. Construction work on a large hotel just south of the Wādī Hamāsa is ongoing.

The survey identified a total of 90 distinct archaeological sites or features. These were given a unique identifier combining the site code and year of fieldwork, BOLAP14, together with a rolling serial number, e.g. BOLAP14-01. They were plotted on Google Earth and registered on an Excel sheet. Sites or features were either identified through remote sensing and ground truthing, or else detected by the magnetometer and ground penetrating radar (GPR). Spot dates were suggested on the basis of ceramics retrieved from the surface or exposed sections resulting from machine truncation. Please note that spot dates should be taken as preliminary indicators pending further fieldwork.

Pre-Islamic Landscape

The earliest dated feature in the vicinity of the survey area is the so-called ‘Qattāra Tomb,’ which lies immediately adjacent to the UAE border fence to the west of the northern survey area (Figs. 2.1 – 2.4). The tomb was discovered and excavated in 1973 and again in 1988 and is generally believed to date to the Wādī Sūq (c. 2000-1300 BC) period (al-Tikriti, 1975: 38-41; Velde, 2003). Finds include the double-headed zoomorphic gold amulet displayed in the al-Ayn National Museum. It is quite possible that this belongs to a Bronze Age cemetery continuing into Buraymī. This would add a third major prehistoric cemetery to the al-Ayn / Buraymī Oasis, in addition to the well-known UNESCO World-Heritage sites of Hafit and Hīlī. The adjacent area in Oman lies within a large residential compound with a boundary wall surrounding private gardens, which contains a low mound, BOLAP14-04, approximately 110 m from the ‘Qattāra Tomb.’ Unfortunately, it was not possible to investigate the mound in the 2014 field season. This remains a research priority and will be targeted by future fieldwork.

Iron Age mounds were discovered throughout the northern survey area and beyond (see table below and Figs. 2.3 & 2.4). Almost all of the mounds presently visible on the surface also appear on the 1968 RAF aerial photograph as a series of ‘white spots’ (Figs. 1.3 & 2.4). Many of the Iron Age sites identified by the French Archaeological Mission in 1976-77 during a survey of the area between the Hīlī and Qattāra Oases may further be identified with ‘white spots’ in the photograph (Cleuziou, 1976-77: Fig. 4). The mounds of the northern survey area therefore belong to a much larger Iron Age landscape, further including the Bayt Bin Ātī site in Qattāra Oasis and the villages of Hīlī 2, Hīlī 17 and Rumaylah (discussed in Power & Sheehan, 2012: 294-96). Indeed, since no significant Iron Age material has been found to the south, it is possible to posit the northern survey area as constituting the southern limits of the Iron Age landscape. Unfortunately the majority of the ‘white spots’ putatively interpreted as Iron Age mounds in both the UAE and Oman have been lost to modern development. This makes the few remaining mounds discovered in the northern survey area all the more important. It is quite possible we are dealing with the last undisturbed area of the Iron Age landscape within the greater al-Ayn / Buraymī conurbation.

Table showing the mounds identified in the northern survey area

Feature	Type	Date	Description	Status
BOLAP14-04	Mound	BA?	Unexamined linear mound parallel with Wādī Sūq tomb	Intact
BOLAP14-01	Mound	IA	Mound covered with white pebbles & a few Iron Age sherds	Damaged
BOLAP14-02	Mound	IA	Mound covered with white pebbles & a few Iron Age sherds	Damaged
BOLAP14-03	Mound	IA	Mound covered with white pebbles & a few Iron Age sherds	Damaged
BOLAP14-07	Mound	IA	Mound with walls and architectural tumble visible in section	Truncated
BOLAP14-08	Mound	IA	Mound covered with white pebbles and Iron Age pottery	Intact
BOLAP14-16	Mound	IA	Mound near BOLAP14-09 and BOLAP14-08	Disturbed
BOLAP14-09	Mound	IA, PIR	Mound covered with white pebbles and Iron Age pottery	Intact
BOLAP14-06	Mound	IA, LI-1	Iron Age mound surmounted by Late Islamic building	Truncated
BOLAP14-13	Mound	IA, LI-1	Iron Age mound surmounted by Late Islamic building	Truncated
BOLAP14-82	Feature	??	Possible mound or building visible in the RAF photograph	Damaged
BOLAP14-83	Feature	??	Possible mound or building visible in the RAF photograph	Destroyed
BOLAP14-84	Feature	??	Possible mound or building visible in the RAF photograph	Destroyed
BOLAP14-85	Feature	??	Possible mound or building visible in the RAF photograph	Destroyed
BOLAP14-86	Feature	??	Possible mound or building visible in the RAF photograph	Uncertain
BOLAP14-87	Feature	??	Possible mound or building visible in the RAF photograph	Damaged
BOLAP14-88	Feature	??	Possible mound or building visible in the RAF photograph	Destroyed
BOLAP14-89	Feature	??	Possible mound or building visible in the RAF photograph	Destroyed
BOLAP14-90	Feature	??	Possible mound or building visible in the RAF photograph	Disturbed

Many of the remaining mounds have been partially truncated and some are in imminent danger of being lost to modern development. However, two undisturbed mounds, BOLAP14-08 and BOLAP14-09, were identified in the western extent of the northern survey area (Figs. 2.3 & 2.4). They are covered with a dense spread of white pebbles and ceramic sherds, which together lend them a distinctly whitish hue at variance to the yellowish brown sands of the central survey area. These white pebbles were not found elsewhere, neither visible on the surface nor revealed in exposed sections, and closely resemble the temper of locally made mudbricks. The mounds show up very clearly on the topographic survey and were investigated with the magnetometer, the less disturbed BOLAP14-09 being further examined with the GPR, which picked up two discrete parallel linear features possibly representing the walls of a ruined house (Figs. 2.7 – 2.9). Modern disturbance is more common to the east of the mounds so that surface finds have been obscured. Nearby mound BOLAP14-07 has been truncated by the construction of a side road revealing the extant lower courses of walls in the section, and mound BOLAP14-13 further to the east has been truncated to create a level building plot revealing architectural tumble in section. Geophysical survey of BOLAP14-13 demonstrated the extent of the walls in plan (Figs. 2.10 & 2.11). Further structural features were visible in disturbed mound BOLAP14-03, cut by the boundary fence of a modern date palm garden. It therefore appears that the mounds of the northern survey area formed around collapsed or deflated mudbrick buildings.

The date of these buildings may be inferred from brick typologies and associated ceramics. Mound BOLAP14-07 preserves several courses of bricks in the truncated section which are very similar to those found at the Iron Age villages of Hilli 2, Hilli 17 and Rumaylah.

These are quite distinct from Late Islamic brick typologies. Ceramics were retrieved from stratified deposits in the machine exposed section through mound BOLAP14-13 and collected from the surface of undisturbed mound BOLAP14-09. The section through mound BOLAP14-13 is c. 40 m long and c. 4 m high (Figs. 2.10 & 2.11). The earliest exposed contexts consisted of two episodes of mudbrick tumble separated by an intervening layer of windblown sand and buried by a 700 mm thick layer of windblown sand (005), together making up somewhat over a half of the visible section. Both of these aeolian deposits produced Iron Age pottery (Fig. 2.20); no earlier or later material was detected. Sherds taken from the windblown surface accumulation (001) overlying the mound included an Iron Age component, but was dominated by Late Islamic 1 material (Fig. 2.21).

Undisturbed mound BOLAP14-09 has a roughly oval plan c. 105 m long by c. 60 m wide covering an area of c. 0.63 ha (Figs. 2.7 – 2.9). The whole mound is covered with pottery and a 5 x 5 m grid was laid out to allow the systematic collection of surface finds (see table below). Sherds were taken from two transects running N/S and E/W, amounting to 26 grid squares covering an area of 0.065 ha, or approximately 10% of the total area of mound BOLAP14-09. Some 1,457 sherds were collected, implying that the total covering the mound approaches 15,000 sherds. Almost all of these were Iron Age with some possibly Late Pre-Islamic and a limited amount of Late Islamic; modern material was almost entirely absent, with only a single piece of modern glazed tile (MGTS) discovered (Figs. 2.12 – 2.19). The Iron Age assemblage ranged from fragments from massive storage jars to fine painted table wares, with 5 sherds from carved steatite vessels (STN), apparently all engraved with linear designs. The possibly Early Islamic assemblage consists of 27 sherds of turquoise alkaline glazed ware, of which 18 sherds had a generally well-preserved green glaze (TURQ.4) and 5 had an often degraded blue glaze (TURQ.5). Most of these sherds represent body sherds from small bowls, with a handle and a rim sherd giving some idea of form. Kennet notes that TURQ.4 is predominant at Kūsh Period II, dated from the seventh to eighth centuries (2004: 37), suggesting that these belong to the Early Islamic period. However, similar green glazed vessels are known to have been produced in Iraq under the Parthians and are found in quantities in the UAE, including at the nearby site of Qattāra (de Paepe 2003: 209, 212, Fig. 4.3; Kennet 2004: 29-31; Mouton 2008: 40-41, 65-66, 94-97, 127-28; Power & Sheehan, 2011a: 275). Further work is necessary to establish the date of the green glazed sherds from BOLAP14-09. If some or all of these sherds transpire to be Late Pre-Islamic upon closer inspection, then Buraymī constitutes one of comparatively few sites in SE Arabia with an occupational sequence potentially spanning the Iron Age to Late Pre-Islamic period, which would make it an exceptionally important site.

Early Islamic Landscape

Early Islamic material was found throughout the survey area. Structural remains were most apparent in the southern survey area, where a c. 150 x 120 m area of partially exposed structural remains associated with quantities of Early Islamic pottery was discovered (see table below and Figs. 4.5 – 4.8). Building BOLAP14-66 was discovered driving along the 2009 street grid when the survey team noticed walls popping out of a truncated dune. Building BOLAP14-65 was

Table showing ceramics collected during surface walking of BOLAP14-09. Refer to Figs. 2.12 – 2.19

SQ	Iron Age	PIR / EI (?)	Late Islamic	Modern	Other
1	62	1 (TURQ.4)	1 (FRIT.BW)	1 (MGTS)	
2	173 (1 STN)	6 (3 T.4, 3 T.5)			
3	103	1 (TURQ.4)			2 shells
4	58	3 (TURQ)			
5	43		1 (MGPAINT)		
6	79	4 (3 T.4, 1 T.5)			1 coin? 1 Cu frag
7	38	2 (TURQ.4)	2 (JULFAR)		
8	14	1 (TURQ.4)	2 (BAHLA)		
9	4		3 (JULFAR)		
10	6				
11	34				2 shells
12	30				
13	63				
14	55	1 (TURQ.4)			
15	95				
TOT	857	19	7	1	

SQ	Iron Age	PIR / EI (?)	Late Islamic	Modern	OTHER
A	136 (2 STN)	2 (TURQ.4)			
B	54				
C	48				1 bangle, 1 shell
D	42 (1 STN)				
E	68 (1 STN)	1 (TURQ.5)	3 (IBWS)		
F	58	2 (TURQ.4)			
G	50	2 (TURQ.4)			
H	29				
I	8				1 flint core
J	28	1 (TURQ)			
K	41				
TOT	562	8	3		

found just to the north. The construction of the road truncated building BOLAP14-67, creating a spread of disarticulated mudbrick stretching for c. 35 m along the south side of the street. Fortunately, the dunes south of the recently constructed street have not yet been levelled so that buildings BOLAP14-68 to BOLAP14-72 presently remain undisturbed. Some attempt to level the dunes surrounding BOLAP14-66 had already been made by the developers, resulting in an

Table showing possible Early Islamic features identified in the southern and central survey areas

Feature	Type	Description
BOLAP14-37	Falaj	Unknown falaj running NW/SE under the northern Late Islamic field system
BOLAP14-52	Falaj	Unknown falaj running NW/SE towards the EI falaj & building at the Jimi School site
BOLAP14-38	Feature	Ambiguous linear feature running NE/SW under the Late Islamic field system. Falaj?
BOLAP14-65	Building	Stretches of wall partially revealed in the sand associated with a building
BOLAP14-66	Building	Truncated building c. 35 m x 15 m associated with quantities of Early Islamic pottery
BOLAP14-67	Building	Spread of disarticulated mudbrick c. 35 m long running parallel with modern road
BOLAP14-68	Building	Stretches of wall partially revealed in the sand possibly associated with a building
BOLAP14-69	Building	Stretches of wall partially revealed in the sand possibly associated with a building
BOLAP14-70	Building	Stretches of wall partially revealed in the sand associated with a building
BOLAP14-71	Building	Stretches of wall partially revealed in the sand associated with a building
BOLAP14-72	Building	Stretches of wall partially revealed in the sand associated with a building
BOLAP14-53	Feature	Ambiguous square feature c. 9 m x 9 m adjacent to EI falaj BOLAP14-52. Building?

irregular crescent-shaped bulldozer scar. The south-eastern corner of a large rectilinear building was nevertheless preserved, with the truncated southern wall extending for c. 15 m and the undisturbed eastern wall for c. 35 m, preserving a large gateway c. 2 m wide and a room c. 5 x 3 m in plan (Fig. 4.7). The walls exposed by bulldozer truncation are preserved to the height of at c. 1.5 m, and the GPR results suggest that their full extent ranges between c. 1.7 and 2.3 m. Clearly the dunes have served to protect and preserve the structural remains, so that the height of the walls is far greater than any Early Islamic site yet found in the al-Ayn / Buraymī Oasis.

The limited area of geophysical survey and only partial exposure of surface features in the mobile sands obscures the extent and nature of settlement. A total of eight discrete areas of mudbrick walls were discovered which may have belonged to eight individual houses, or else a smaller number of larger residential complexes. However, a walk through the dune fields revealed not infrequent scatters of Early Islamic pottery, suggesting that the potential area of settlement is much larger. Excavations by the Abu Dhabi TCA at the Bayt Bin Ātī in nearby Qattāra Oasis documented two phases of post-hole structures associated with Early Islamic pottery, interpreted as evidence for ‘arīsh or palm-frond buildings (Power & Sheehan, 2011a: 275-76; Fig. 8). Since ‘arīsh buildings were being used in the Early Islamic period in the al-‘Ayn / Buraymī Oasis, it is possible that the cluster of mudbrick buildings discovered in the BOLAP southern survey area belonged to a larger settlement of mostly ‘arīsh buildings. This begs the question as to whether a low-density settlement could have extended to ‘Awd al-Tawba, about 1.2 km to the south-east, where the Abu Dhabi TCA are currently excavating another cluster of Early Islamic mudbrick buildings (al-Tikriti, 2003; al-Tikriti et al, 2015). These may alternatively have belonged to a discrete and separate settlement. There is further evidence for outlying individual buildings away from these putative villages. Part of a rectilinear buttressed building was recently discovered by TCA Abu Dhabi immediately south-east of the Jimī Oasis. This building is adjacent to a falaj running into the BOLAP central survey area, where the geophysics team picked up another building located beside the falaj, BOLAP14-53, which could also belong to the Early Islamic occupational horizon. Early Islamic occupation therefore seems to have been quite considerable, especially when it is considered that the

horizontal boundaries of settlement in the southern survey area were not fully defined, so that the results of the first field season should be taken as a preliminary indication of what remains to be discovered.

A number of potentially Early Islamic *aflāj* were detected through remote sensing and geophysical prospection. In the central survey area, two unidentified linear features running N-NE/S-SW were picked up by the magnetometer, namely BOLAP14-37 and BOLAP14-52. These are overlaid by the Late Islamic field system (see below) and therefore predate it. A test pit dug in this area revealed a compact layer of silt overlying the natural cut by root action, the fill of which produced a few sherds of Eggshell Ware, interpreted as an Early Islamic cultivation horizon. No other sub-surface occupational horizons were detected, implying that the *aflāj* are contemporary with the earlier phase. Falaj BOLAP14-52 is on the same alignment and route as a falaj recently discovered by the Abu Dhabi TCA on the other side of the border fence, about 425 m to the north east, immediately adjacent to Jīmī Oasis within the architectural footprint of a proposed school. Ceramics from the Jīmī School site suggest a broadly Early Islamic date for falaj BOLAP14-52. The Early Islamic cultivation horizon and *aflāj* discovered in the central survey area help provide an economic context for the mudbrick settlement found in the southern survey area. Further excavations are required to ascertain these preliminary hypotheses and understand the hydraulic infrastructure of sedentary life in the Buraymī region.

Ceramics allow the date of Early Islamic occupation to be refined somewhat. Surface sherds were intermittently visible across most of the southern survey area and not limited to BOLAP14-66 to BOLAP14-72. Qualitative observation suggests that the material is fairly homogenous. Sherds were collected at random from BOLAP14-66 to provide a ‘spot date’ for occupation (Figs. 4.9 – 4.13). In fact, two phases of occupation may be inferred:

(i) 8th & 9th Cs. Glazed ceramic classes include turquoise alkaline glazes with barbotine decoration (TURQ.5), thought to have been introduced in the mid eighth century, and opaque white tin glazes with in-glaze blue cobalt decoration (COBALT), believed to have gone out of use before the foundation of Sāmarrā’ in 836 (Kennet, 2004: 36 & 40). Reasonable quantities of opaque white tin glazes (YBTIN) were retrieved, dated from 836-61 to the mid-tenth century on the basis of Sāmarrā’ and Sīrāf (Kennet, 2004: 39). A single white glazed sherd with in-glaze black cobalt decoration (BTIN) was also found. Unglazed types include large incised storage vessels (LSIV) and ‘Eggshell Ware’ (EGG), dateable to the eighth and ninth centuries (Kennet, 2004: 78-79 & 82).

(ii) 11th & 12th Cs. A single sherd of hatched sgraffiato (HGRAF) and a possible sherd of champlévé (CHAMP) suggests some activity in the eleventh and twelfth centuries (Kennet, 2004: 43 & 46-47). Both of these types were found at the Bayt Bin ‘Ātī excavations in Qaṭṭāra, and Andrew Peterson found a single sherd of sgraffiato on the surface of the Qal‘at al-Sudayrī site (2009: 71). Unglazed sherds include a fair amount of possibly proto-Julfār Ware, which Kennet notes is associated with hatched sgraffiato in Ras al-Khayma (Kennet, 2004: 82). It may further be of significance that some of the ‘Eggshell Ware’ has fine moulded decoration, similar to tenth- to twelfth-century Iranian instances illustrated in Oliver Watson’s publication of the Āl Sabāh collection (2004: 107). Future excavations of sites BOLAP14-66 to BOLAP14-72 will aim

Phase	Date	Coins	Pottery
LI-1a	1500 – 1650	Şafavid (c. 1501-1722)	CBW, PERSIA, GMONO.2
LI-1b	1650 – 1800	Şafavid (c. 1501-1722)	CBW, MGPAINT, GMONO.2, REDYEL
LI-2a	1800 – 1850	Qajar (c. 1785-1925), Rāj (pre-1857)	<i>Imported types disappear?</i>
LI-2b	1850 – 1900	Āl Bū Sa‘īdī (1890s), Rāj (1857-1947)	CHING, MGPAINT, PPWW, TPWW
LI-2c	1900 – 1950	Pahlavi (c. 1925-79), Rāj (1857-1947)	CHING, PPWW, TPWW, JCCC
MD-1	1950 – 1970	Baḥraynī (post-1965)	TPWW, JCCC, MMAP
MD-2	1970 – 1990	UAE (post-1971)	JCCC, MMAP
MD-3	1990 – 2010	UAE (post-1971)	JCCC, MMAP

Table showing a suggested ceramic chronology for the Late Islamic and Modern periods in the al-Ayn / Buraymī Oasis. Refer to Fig. 1.9 for class codes and photographs.

to produce a well-stratified sequence supporting a typological quantification of the assemblage, which will cast light on the duration of occupation and the commercial contacts of the local community.

Late Islamic Landscape

The Late Islamic period in SE Arabia spans the last five centuries, for which the arrival of the Portuguese in 1507 and rapid modernisation beginning in 1970 provide convenient chronological markers. The study of ceramic and numismatic finds from secure stratigraphic contexts at multiple sites in al-Ayn has allowed a refined chronology for the Late Islamic period to be put forward. The finer points and full publication of this chronology remain in preparation, although some preliminary findings have been published (Power & Kaabi, 2015; Power & Sheehan, 2012: 297-304; Figs. 3 & 4). Historical sources are additionally important for the study of the Late Islamic period. Written primary sources include the Ibādī chroniclers and British observers, which provide causative explanations and supplementary details for patterns noted in the archaeological record. Sketch plans and archive photographs become available from the mid-twentieth century, with aerial photographs particularly useful for remote sensing. Finally, oral history is an extremely important source of information about the development of the landscape during the transition to modernity; we have set up a subsidiary ethnographic project to explore this transition, with a particular focus on water and society. A full exploration of these sources is beyond the scope of this article but will be addressed in the final publication.

As the most recent archaeological period, the material culture of the Late Islamic period dominates any survey of visible surface features. Nevertheless, the typological quantification of ceramics from the c. 5 m sequence spanning the past three thousand years discovered at the Bayt Bin Ātī in Qattāra Oasis suggests that the Late Islamic period represents a peak occupational episode in the al-Ayn / Buraymī Oasis (Power & Sheehan, 2011a: 277-79).

The Qattāra Falaj (BOLAP14-22) and Jīmī Falaj (BOLAP14-55) constitute salient topographic features in the landscape (Fig. 3.3 & 3.4). They extend from Oman under the present border fence into the UAE, a vivid testament to the shared history of the al-Ayn /

Buraymī Oasis. It is possible to trace the *aflāj* by following their *thuqb*, excavation shafts surrounded by up-cast material, visible in the archive photographs or as extant surface features. The *thuqb* of the Qattāra Falaj, for instance, show up clearly on the oblique aerial photograph from the 1960s (Fig. 1.4 & 1.5). Moreover, the routes of the *aflāj* may be read into the alignment of field boundary walls and situation of mosques and forts built to utilise or control the flow of water. For example, the small mosque in the central survey area, BOLAP14-23, was built next to the Jīmī Falaj and provided with stairs to access the water necessary for the ritual ablutions preceding prayer. Their importance to the field systems and forts will be discussed below. The main *aflāj* appear in sketch maps made before modern development transformed the landscape in the 1970s (Fig. 1.8). However, it is clear from our remote sensing and geophysical survey that the *aflāj* network was more complex than these maps suggest. A diachronic model for the development of the *aflāj* network as the basis of land use and settlement remains a long term goal of the *Buraymī Oasis Landscape Archaeology Project*.

The Qattāra Falaj flows for c. 3 km from its source in the Wādī Hamāsa through the Buraymī Oasis proper and on to Qattāra Oasis. According to a Abu Dhabi Environment Agency report on the *aflāj* of al-Ayn, “between 1964-1969 [the Qattāra Falaj]... averaged a flow of 31 l/s and a TDS of 473 mg/l... The Qattara oasis is 47.62 ha in size and contains over 40,000 date palm trees” (2006: 15). The route of the falaj through the Buraymī Oasis is marked by an axial thoroughfare running through the palm groves, and formed the basis for a linear settlement in the northwest as it emerges onto the plain. It is not at all clear if the falaj was cut in a single phase, which would logically make the Buraymī and Qattāra Oases contemporaries, or if the eponymous Qattāra stretch represents a later extension, making the Buraymī Oasis older than Qattāra Oasis. The Jīmī Falaj flows for c. 2 km from the Wādī Hamāsa, bearing E/W before turning to run NW/SE up towards Jīmī Oasis. Again, the route of the falaj corresponds to a thoroughfare through Hamāsa, specifically the neighbourhood of Hārrat al-Qādhī. A subsidiary branch of the Jīmī Falaj picked up by the geophysics flows NW/SE towards the *wādī*, although it is not possible to trace the source. The relationship between the two branches is not clear. However, there are some grounds for thinking that the E/W branch is later (discussed below).

The traditional oasis environment consisted of a core of palm-groves under which fruits were grown surrounded by open fields of wheat and animal fodder (Zwemer, 1902: 62; Lorimer, 1915: 260-264; Cox, 1925: 207-08). How far back the oasis agrosystem may be traced and extent to which the nine distinct date-palm oases of the al-Ayn / Buraymī group share a developmental dynamic remain open to debate. The Abu Dhabi TCA excavations at the Bayt Bin ‘Ātī in Qattāra Oasis demonstrated that date-palm groves there were dug in the Late Islamic 1b (c. 1650/1700-1800) period, and we have argued that this belong to a regional expansion of agriculture under the Āl Yaruba (Power & Sheehan, 2012: 297-303). Given that groundwater moves from the mountains in the east to the plain in the west, aided by *wādīs* and directed by *aflāj*, it might logically be argued that the more easterly Buraymī and Saarā Oases are older. The Ibādī histories refer to the demolition of forts in the oases around the year 1633 (Sirhān b. Saīd, 1984: 53), implying that there was some sort of sedentary occupation at the time, though it would be unwise to assume the oasis agrosystem was already in place. Certainly the oasis environment should not be imagined as static. Historical sources suggest that the al-Masūdī and

Muwaijī palm groves were only established by the Āl Nahayyān in the late nineteenth and early twentieth centuries, broadly borne out by Abu Dhabi TCA excavations at the Qahr al-Muwaijī (Power & Sheehan, 2011b). It is worth noting, too, that oases can wither away. The date groves of Saarā Oasis have almost entirely disappeared following the drop in the water table since the 1970s. The oasis environment, then, should be understood as a fluid relationship between human beings and the natural world. The origin and development of the Buraymī Oasis proper will therefore be targeted by future fieldwork.

Important new information pertaining to the development of the oasis landscape was obtained from the present season's survey. A solitary field boundary wall, BOLAP14-25, was found near the Qattāra Falaj. This appears on the oblique aerial photograph from the 1960s, where it is surrounded by further field boundary walls not now visible on the surface, suggesting that a field system once surrounded the Qattāra Falaj. Clusters of field boundary walls were found in the northern survey area, viz. BOLAP14-10, BOLAP14-11, BOLAP14-12 and BOLAP14-17 (Figs. 2.5 & 2.6). These areas were not covered by the geophysical survey but it is highly likely that more walls remain to be discovered beneath the surface. A remarkably undisturbed pre-modern field system was discovered in the central survey area, the open plain of desert scrub linking the Buraymī Oasis proper and the Jīmī and Qattāra Oases, covering an area c. 440 m N/W x c. 260 m E/W (Figs. 3.1 – 3.7). The Shaykh of the Shawāmis told us that the area is known as *al-Bustān*, meaning garden, and said it used to be planted with wheat and before that with palms. However, the sketch plans and aerial photographs from the '50s and '60s demonstrate that the field system was abandoned beyond living memory (Fig. 1.4 & 1.6). The lateral extent of the al-Bustān Field System was obscured first by the construction of the Khrais roundabout and Dubai road, which appear in the 1968 RAF aerial photograph (Fig. 1.3), and then truncated by the UAE border fence and Buraymī ring road in recent years. It nevertheless seems clear that the al-Bustān Field System covered much of the area between the Buraymī Oasis proper and the Jīmī Oasis. Taken together with the less well preserved field boundary walls to the north, it soon becomes apparent that the Buraymī Oasis proper was once considerably larger than at present, apparently over half as much again.

The exceptional preservation of the al-Bustān Field System affords an excellent opportunity to study traditional agricultural practices and changing land use in the Early Modern period. Its longitudinal extent is parenthesised by two parallel cemeteries (Fig. 3.3 & 3.4) whose chronological relationship is discussed below. Internally, the field system is divided laterally by the Jīmī Falaj. The southern area appears to be divided into much larger plots, c. 60 x 170 m, which may result from different land use or constitute a later addition. The northern area is divided into a grid of sub-rectangular plots, c. 30 x 80 m, on a regular E/W alignment. Field boundary walls are constructed of a single row of mudbricks and survive to a height of about 300 mm, the tumble having been robbed out or eroded away by winds sweeping over the plain. Four N/S and six E/W axial field boundary walls are visible on the surface (see table below). Surface ceramics were not systematically collected or quantified. However, qualitative observation suggests that the assemblage is Late Islamic 1 (c. 1500-1800). A test pit was dug targeting the relationship between the northernmost E/W axial wall, BOLAP14-31, and the uncertain structural feature, BOLAP14-33, which transpired to be contemporary. The walls were underlain by a firm / friable sand containing Late Islamic 1 sherds, and overlain by layers

Table showing the axial field boundary walls of the well-reserved al-Bustān Field System

Feature	Length	Description
BOLAP14-41	c. 190 m	First (westernmost) axial N/S boundary wall of northern Late Islamic field system
BOLAP14-34	c. 150 m	Second axial N/S boundary wall of northern Late Islamic field system
BOLAP14-35	c. 150 m	Third (easternmost) axial N/S boundary wall of northern Late Islamic field system
BOLAP14-50	c. 60 m	Fourth axial N/S wall on different alignment to the other axial N/S walls
BOLAP14-31	c. 200 m	First (northernmost) axial E/W boundary wall of Late Islamic field system
BOLAP14-36	c. 130 m	Second axial E/W boundary wall of Late Islamic field system
BOLAP14-39	c. 115 m	Third axial E/W boundary wall of Late Islamic field system
BOLAP14-40	c. 195 m	Fourth axial E/W boundary wall of Late Islamic field system
BOLAP14-44	c. 120 m	Fifth axial E/W boundary wall of Late Islamic field system
BOLAP14-45	c. 75 m	Sixth (southernmost) axial E/W boundary wall of Late Islamic field system
BOLAP14-54	c. 50 m	Isolated stretch of wall running E/W parallel to north of Jīmī Falaj
BOLAP14-55	c. 2 km	Jīmī Falaj running E/W from Buraymi Oasis & turning NW/SE towards Jīmī Oasis
BOLAP14-59	c. 170 m	First (westernmost) axial N/S boundary wall of southern Late Islamic field system
BOLAP14-61	c. 130 m	Second (easternmost) axial N/S boundary wall of southern Late Islamic field system
BOLAP14-62	c. 200 m	Axial curvilinear E/W wall of southern Late Islamic field system. Southernmost?

of degraded mudbrick and fine windblown sand containing more Late Islamic 1 pottery. None of the readily identifiable European refined white wares were noted, suggesting that occupation had ended by the mid nineteenth century.

A number of apparently isolated Late Islamic buildings were discovered scattered through the northern and central survey areas (see table below). Many of these buildings are surrounded by abandoned field systems and are probably broadly contemporary with them. Amongst the better preserved are tower houses BOLAP14-14 and BOLAP14-19, which appear in the oblique aerial photograph from the 1960s and the 1968 RAF photograph (Fig. 1.4 & 1.5), where they already appear to have fallen into ruin. Archaeological work by the Abu Dhabi TCA on the historic buildings of al-Ayn suggests that the large tower houses belong to the Late Islamic 1 (c. 1500-1800), for instance the Bayt Bin Ātī and Bayt Bin Biduwa in Qattāra Oasis (Power & Sheehan, 2012: 297). However, the towers of both BOLAP14-14 and BOLAP14-19 appear to have been rebuilt, whilst the generally good state of preservation implies that occupation continued into the Late Islamic 2 (c. 1800-1950). Completely ruined tower houses surviving as little more than mounds of rubble include BOLAP14-05, BOLAP14-26, BOLAP14-43, BOLAP14-74, BOLAP14-75 and BOLAP14-77, which may tentatively be placed in the Late Islamic 1 pending further investigation. Note that these features appear on the 1968 RAF photograph as virtually identical to the well-dated Bayt Bin Ātī (Fig. 1.3). Tower house BOLAP14-26 is particularly interesting as it logically predates the ‘Northern Cemetery’ and provides a hypothetical terminus ante quem for the change in land use. Other buildings appear at little more outlines on the surface, including BOLAP14-06, BOLAP14-18, BOLAP14-29, BOLAP14-48, BOLAP14-51 and BOLAP14-76. One of the sketch maps shows the area around BOLAP14-05 and BOLAP14-06 is labelled Khirbat al-Jararihah denoting a ruin field (Fig. 1.7).

Whilst it is tempting to place these in the Late Islamic 1 on the basis of their advanced state of ruin, localised factors affecting the survival of mudbrick need to be taken into

Table showing Late Islamic buildings identified in the survey

Feature	Spot Date	Status	Description
BOLAP14-23	LI	Standing	Small mosque adjacent to the Qattara Falaj occupied in 1968
BOLAP14-30	LI-2	Standing	Courtyard house & garden plot with well occupied in 1968
BOLAP14-56	LI	Standing	Ruined building already derelict in the 1968 (truncated)
BOLAP14-57	LI	Standing	Ruined building already derelict in the 1968 RAF photo
BOLAP14-58	LI	Standing	Ruined building apparently still occupied in the 1968
BOLAP14-14	LI-1	Standing	Tower house with enclosure walls
BOLAP14-19	LI	Standing	Tower house with enclosure walls
BOLAP14-05	LI-1	Mound	Completely ruined tower house surviving as mound of rubble
BOLAP14-26	LI-1	Mound	Completely ruined tower house surviving as mound of rubble
BOLAP14-43	LI-1	Mound	Completely ruined building adjacent to the Jīmī Falaj
BOLAP14-74	LI-1	Mound	Completely ruined tower house surviving as mound of rubble
BOLAP14-75	LI-1	Mound	Completely ruined tower house surviving as mound of rubble
BOLAP14-77	LI-1	Mound	Completely ruined tower house surviving as mound of rubble
BOLAP14-06	LI-1	Outline	Late Islamic building overlying Iron Age mound
BOLAP14-18	??	Outline	Heavily ruined building visible in RAF 1968 photograph
BOLAP14-29	LI-1	Outline	Large heavily ruined building already derelict in the 1968
BOLAP14-48	LI-1	Outline	Rectangular building at extant eastern end of BOLAP14-45
BOLAP14-51	LI-1	Outline	Building abutting BOLAP14-50 and overlying the Jīmī Falaj
BOLAP14-73	LI-2	Outline	Site of the Ḥisn al-Sudayrī visible in the 1968 RAF photo
BOLAP14-76	LI-1	Outline	Rectangular structure visible in outline in the 1968 RAF photo

consideration: all structural remains in the exposed plain of the central survey area appear to have been heavily eroded by the wind. A good deal of work remains to be done to establish the date of these buildings and map changing settlement patterns. However, it seems clear that the peak of occupation in the Late Islamic 1 (c. 1500-1800) period included a low-density settlement coterminous with the extensive field system outlined above.

Historical sources and oral traditions supply further information about settlement. Kelly's sketch map dated 1964 shows the existence of three 'forts' (tower houses?) to the northwest of Hamāsa (Fig. 1.7). It is difficult to locate these precisely, although the heavily ruined building BOLAP14-29 appears to have an enclosure wall c. 80 m long, which would certainly make it a potential candidate.

One of the sketch maps supplies toponyms along the western edge of the Buraymī Oasis proper, namely the hamlets of *Harat 'Adhm* ('Azm?) and *Harat al-Qadhi* (Qādī?), with the plain beyond given as *Idan Muqattarah*. One wonders if *Harat 'Adhm*, possibly meaning the 'hamlet of bones,' takes its name from its location opposite the 'Northern Cemetery.' *Idan* is the plural of *Awd*, literally meaning branch but signifying tree in the local dialect. Since nineteenth century sources refer to acacia 'forests' north of the oases and *ghaff* trees are visible in mid twentieth-century photographs taken at Muwayjī, it is possible that desert trees were growing in the plain between Jīmī / Qattāra. Although not cultivated, such wild species were no doubt utilised for grazing and possibly also fuel and as such represent a natural resource of the historic environment.

Two large historic cemeteries were identified during the survey (Fig. 3.3 & 3.4). The 'Northern Cemetery' includes a rectangular concrete enclosure, BOLAP14-27, measuring c. 200 x 100 m. However, it seems that the modern enclosure wall does not correspond well to the true boundaries of the historic cemetery. Graveyards were not traditionally delineated by boundary walls and graves were marked only by unworked stones, with more recent burials reusing stones taken from nearby older graves. The tendency is therefore for the older areas of cemeteries to become forgotten and unprotected by recently erected enclosure walls. Walls are first evidence of site management, i.e. an approximate response to perceived threat from modern development to known element of cultural landscape. Cemetery walls are also coincidentally protecting earlier features of this landscape like LI 1 houses and field systems. We argue that based on new information this protection should be extended to include full area of cemeteries and all earlier elements that have now been identified. Two more cemeteries are known just over the UAE border fence, with reports of human remains found during the construction of the Khrais ADNOC Garage and the Al Ain-Dubai Road, and graves found during Abu Dhabi TCA excavations at the Jīmī School site beyond the boundaries of the adjacent cemetery. A discrete burial area, BOLAP14-81, was picked up by the magnetometer in the northern al-Bustān Field System, and disarticulated human remains were subsequently noticed on the surface near test pit targeting BOLAP14-33. Moreover, the area between cemetery BOLAP14-27 and BOLAP14-81 is conspicuously devoid of visible surface features, possibly suggesting that earlier activity has been obscured by an overlying cemetery. These series of marked and unmarked burial grounds should be understood as belonging to the single larger historic entity, here dubbed the 'Northern Cemetery,' in which the unmarked graves are vulnerable to continued modern development. A hypothetical date may be put forward on the basis of the prominent ruins of a large tower house, BOLAP14-26, visible within the cemetery enclosure wall BOLAP14-27. Given that this house type appears to have been most common in the Late Islamic 1 (c. 1500-1800), it follows that the 'Northern Cemetery' formed in the Late Islamic 2 (c. 1800-1950), once the extensive field system and low-density settlement had been abandoned.

The 'Southern Cemetery' consists of two modern enclosure walls BOLAP14-63, c. 200 x 270 m, and BOLAP14-63, c. 160 x 80 m, separated by the modern Buraymī ring road. An unmarked open area immediately beyond the UAE border fence possibly also belongs to this group. Together they very likely comprise a single historic cemetery c. 730 x 320 m in area that has been cut by the road in recent times. The southern extent of the cemetery is defined by the course of the Wādī Hamāsa, whilst the northern boundary corresponds with the southernmost axial E/W wall of the al-Bustān Field System, BOLAP14-62, implying that at least the southern extent of the field system post-dates the cemetery. However, the NW/SE branch of the Jīmī Falaj runs beneath the cemetery, and, since its *thuqb* are not visible, logically pre-dates the cemetery. One might conclude that the NW/SE branch of the Jīmī Falaj is the oldest feature in the landscape, followed by the northern extent of the al-Bustān Field System which formed along it. This branch then seems to have gone out of use and the 'Southern Cemetery' allowed to form over it. Finally, the E/W branch of the Jīmī Falaj was dug and the al-Bustān Field System extended to the limits of the 'Southern Cemetery.' Other interpretations are no doubt possible and this represents a preliminary hypothesis based on observation of surface features to be tested further by targeted archaeological interventions in the next phase of research.

Areas Outside the BOLAP14 Survey

The main areas of historic settlement and associated forts were not included in the survey but will be briefly discussed here to give context. Most of the standing structures belong to the Late Islamic 2 (c. 1800-1950) landscape and this section has therefore been placed at the end of the report. The survey area occupies the narrow plain between the Buraymī Oasis proper and the twin oases of Qattāra and Jīmī, presently c. 600 m apart but possibly much closer in the past, which together form a discrete cluster separated from the Hīlī Oasis c. 2 km to the north and al-Ayn Oasis c. 2.5 km to the south. Hamāsa was built flanking the Wādī Ḥamāsa south of the Buraymī Oasis proper, and dominated by the Shawāmis from at least the nineteenth century. The village represents a high-density nucleated settlement of two- and three-storey mudbrick houses, with discrete residential and commercial areas respectively located to the south and north of the *wādī*, both provided with stone revetment to prevent erosion from seasonal flow of water. The origins of this settlement will be investigated by future fieldwork, though most of the standing structures likely date to the Late Islamic 2 (c. 1800-1950) period. Across the plain lay the Darmakī settlement of Hārrat al-Qattāra and the Zāhīrī settlement of Hārrat al-Khrays, which appear to have been (re-)established under Shaykh Zāyid b. Khalīfa (r. 1855-1909) (Power & Sheehan, 2012: 303-04). The *hārras* were low-density linear settlements of single-storey houses built for the most part in a hybrid of *arīsh* and mudbrick. In the Late Islamic 2 period, Hamāsa was the largest settlement in this area and its *sūq* was particularly important to the local economy; it is known to have been the place where slaves were brought for sale.

The Buraymī forts mostly cluster between the villages of Hamāsa and Buraymī, a doubly strategic location given the convergence of a number of *aflāj*. The best preserved is the Qasr al-Hillah in the centre of Buraymī village. It was formerly the residence of the Shaykh of the Naīmāt, but by the 1950s had become the residence of the Sultan’s governor (Kelly, 1964: 34). The date of construction is unclear but it is possibly the latest of the forts. The oldest known fort is the Qalat al-Subara. It is said to have been built by the Nubian slave-soldier al-Harīq during the first Wahhābī occupation between 1800 and 1818 (Kelly, 1964: 54). The date of abandonment is uncertain but must post-date 1840, when Captain Hamerton observed “on the north side [of the Qalat al-Khandaq], about three hundred paces distant, is another and smaller fort [the Qalat al-Subara], about thirty-five paces in length, and fifty in breadth, the wall about fifteen feet high, and loopholed” (Hughes, 1856: 116-18). The outline of the fort is visible in the 1968 RAF photograph (Fig. 4.2 & 4.4) and the site was shown to us by the Shaykh of the Shawāmis, though it has been considerably obscured by truncation and dumping in recent years. Qal’at al-Khandaq is thought to have been built by the Wahhābī *nāib* Mutlaq al-Mutayrī (r. 1808-13), though by the time Miles passed through in 1875, the fort had been occupied by the Naīmāt (Kelly, 1964: 95). The fort has been investigated archaeologically by Nasser al-Jahwari (2002) and has been extensively restored in recent years. Hamerton gives a reasonably detailed account of its original appearance:

“On the south side of the town, however, in an open plain, is a fort, nearly square, surrounded by a dry ditch, about twenty-four feet wide, inside of which is a wall, about eight feet high, for the protection of matchlockmen while defending the ditch. About

thirty feet distant, and inside of this wall, is the fort wall, about fourteen feet in height, and five in thickness at the base, and at the top only eighteen inches or two feet. It has round towers at the angles, but ill constructed, and the whole built of sun-dried bricks. The length of the fort, inside, Captain Hamerton found to be sixty-one paces, and the breadth sixty.” (Hughes, 1856: 116-18)

Qalat al-Sudairī is thought to have been built after 1853 by the Wahhābī *nāib* Turkī b. Sudairī (Kelly, 1964: 83), and indeed Hamerton makes no mention of the Qalat al-Sudairī which broadly confirms its post-1853 date. A letter from Azzan b. Qays (r. 1869-71) to the British Political Resident in the Gulf records his expulsion of the Wahhābīs, stating that “some of their fortresses have been destroyed by action of a cannon” (Kelly, 1964: 87). The fort is today surrounded by the modern town of Buraymī, though Kelly’s 1960 sketch plan and the 1968 RAF photograph show that it was once located in open ground (Fig. 1.3 & 1.6). No standing structures remain. However, Kelly described “raised lines of earth and rubble” (1964: 95) in the early 1960s and the outline of the fort can be seen in the 1968 RAF photograph. The area where the fort once stood is today surrounded by a concrete wall demarking a building plot for a hotel. Overlaying the 1968 RAF aerial photograph with Google Earth reveals that most of the fort was cut by the boundary wall and apparently lost to modern development (Fig. 4.2 & 4.4). Only the south-west tower and sections of the southern and western enclosure walls of the fort survive, with perhaps about half of the original interior undisturbed. Future geophysical survey could delineate the plan of the fort and identify locations suitable for excavation. The limited duration of occupation, between c. 1850 and 1870, would help anchor the Late Islamic ceramic sequence of SE Arabia.

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APPENDIX – CONSERVATION AND SITE MANAGEMENT

Recommendations for conservation and site management

The urgent question now facing BOLAP is how this new archaeological information can be integrated into the management and presentation of the various components of the site. Immediate actions include:

- Budgeting for and implementation of urgent program of fencing for key sites threatened by development
- Liaison with Buraimi Municipality to prevent further dumping of construction debris
- Meetings with Buraimi Municipality Town Planning to upload archaeological information on layers within GIS/cadastral survey
- Planning for phase 2 of survey – including rescue archaeology of sites identified in phase 1, documentation of standing structures in Hamasa etc.

Outline Framework for a management plan for Buraimi Oasis

At the same time work should begin on developing a management plan for the site that should include the following steps:

1. Identifying Key Players - how will they be involved?

- Buraimi Oasis Landscape Archaeology Project (BOLAP) (survey, archaeology, conservation, overall writing of CMP & implementation of plan)
- Buraimi Municipality - Town Planning – building & roads; Aflaj & Oasis management,
- Military and Police – border fence issues
- Utilities providers
- UNESCO community. how new data can be reconciled with the existing UNESCO WHS site in Al Ain, and with the mechanisms and criteria associated with the World Heritage Convention
- Former & present owners & residents
- Visitors - local and external

2. Documenting the landscape of Buraimi – what do we know about the site?

- Standing building survey of Hamasa village – 3D laser scan, aerial photography
- Rescue archaeology of sites already affected by construction works
- Further geophysical study
- Production and dissemination of information – booklets, film? etc

3. Assessment of Significance and development of Statement of Significance – the reasons why Buraimi is important / what values does it have?

- Establishing range of values of the site , these include;
- historic (prehistoric sites, development over time, relation to tribes and families, relation to existing settlement, importance of Hamasa souq and other individual buildings)
- Scientific (archaeological investigation and understanding of buildings, finds etc., past agriculture and water usage, ethnoarchaeology)
- social (relation to tribes and families, relation to existing settlement, local feelings and attitudes towards site, educational value to locals and visitors , public access, religious value of mosques and cemeteries)
- aesthetic (relation to oases, ambience and natural setting)

4. Management assessment – what are the constraints and opportunities at Buraimi that affect the working management of the site?

Management structure

- Legal situation – plan showing ownership
- Government and municipal policies
- Management environment and responsibilities
- financial resources

Conservation opportunities and threats

- physical condition of the site – past and current causes of deterioration
- technical options/possibilities for conservation and presentation– reburial, , reconstruction, stabilization, signage etc
- needs and expectations of the community/stakeholders
- possible patterns of visitor use
- threats to fabric - house construction, infrastructure weather, visitors
- threats to ambience- building construction, land use
- threats to values – visitors, lack of dissemination, conservation interventions

MEETING OF KEY PLAYERS AT THIS POINT TO REVIEW PRESENTATION OF ABOVE

5. Management policy – why is Buraimi going to be managed? What are the objectives? How will this affect the place, its significance and all those involved? Policy needs to;

- Explain the implications of the Statement of Significance?
- Present how the importance of the site is going to be conserved in the short and long terms

- Provide principles and guidelines for investigation, interpretation interventions, mitigation, reuse
- Propose long term management structure and decision making
- Provide for Monitoring and review of the plan
- Be acceptable for all owners/authorities
- Reflect community wishes
- Be feasible technically and financially
- Provide a timetable

Policies should cover

- Protection
- Public access
- Interpretation
- Future research
- Staff needed
- Maintenance

6. Management strategies – putting the objectives into practice

- Investigations and survey
- Maintenance -
- Conservation – stabilization, restoration, shelters, roofing
- Presentation – reconstruction, site museum, adaptive reuse?
- Visitor management - fencing, paths
- Conservation of artifacts

7. Implementation (with schedule), monitoring and periodic re-assessment

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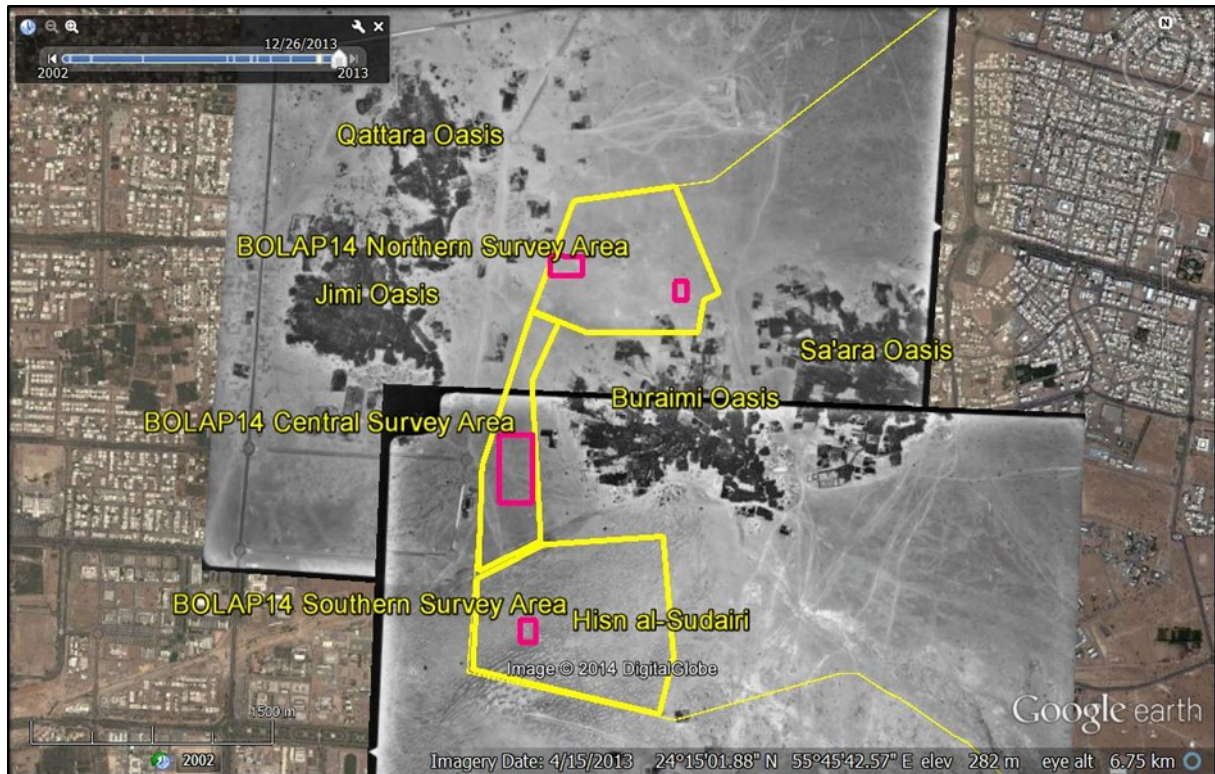
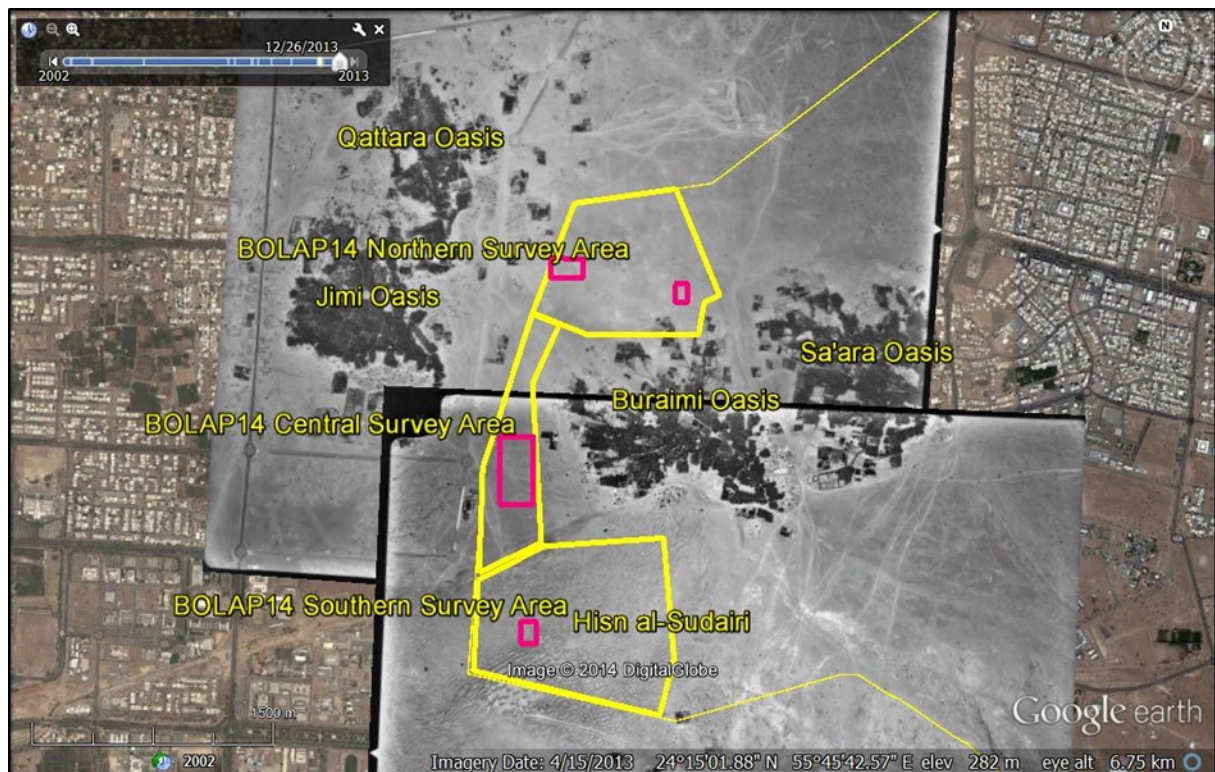


Fig.1.1 – BOLAP14 survey areas (thick yellow lines) & geophysical survey (thick pink lines)

Fig. 1.2 – BOLAP14 survey areas superimposed on the 1969 RAF aerial photograph



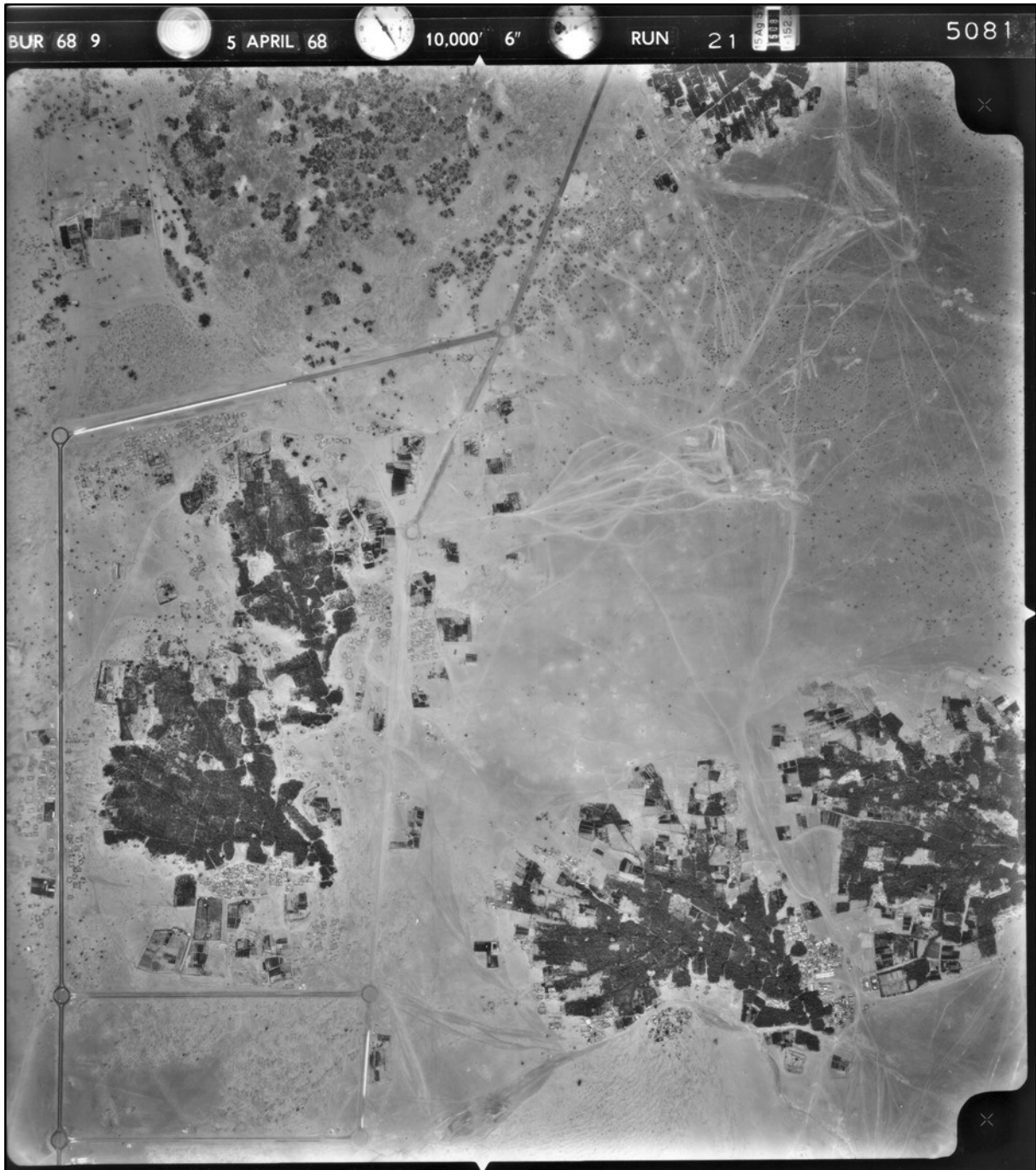
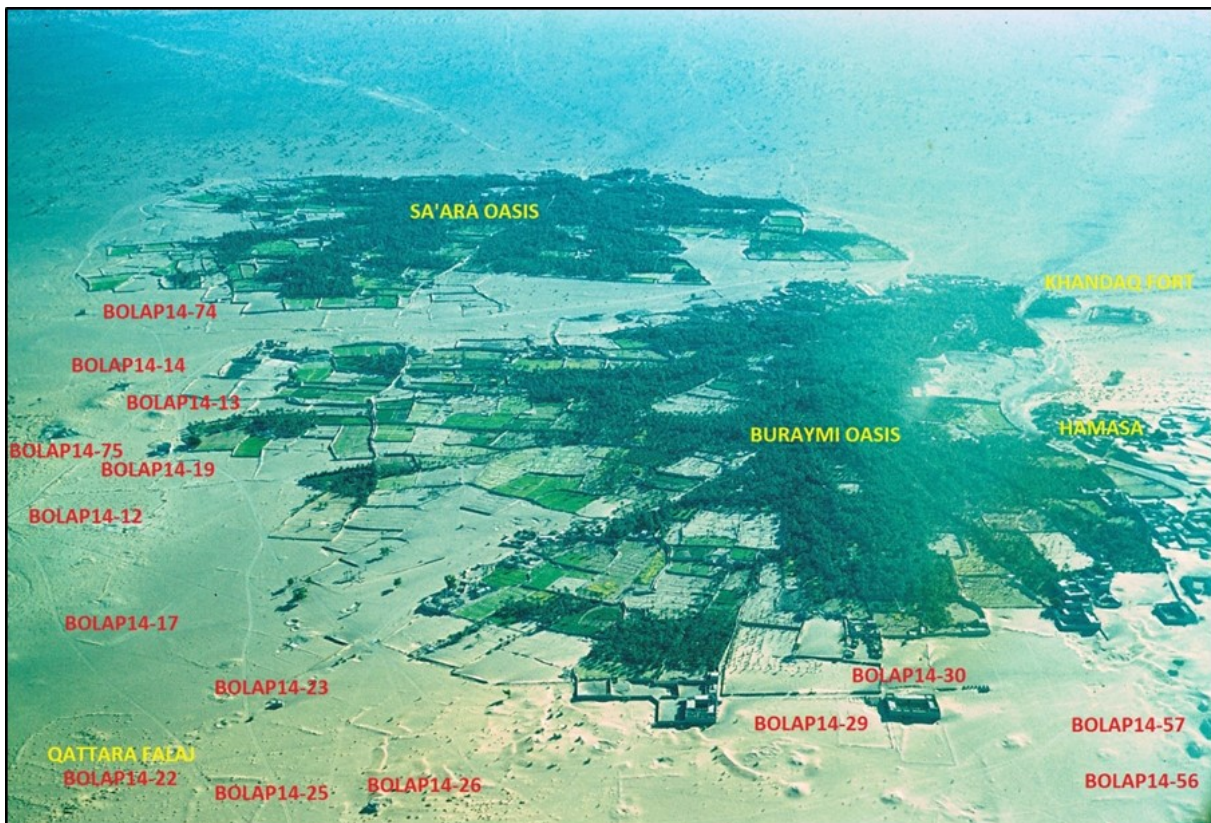


Fig. 1.3 – The 1968 RAF aerial photograph showing the survey area



Fig. 1.4 – Anonymous aerial photograph of Buraymī and Şa'āra taken in the 1960s

Fig. 1.5 – BOLAP14 sites and features visible on the same photograph



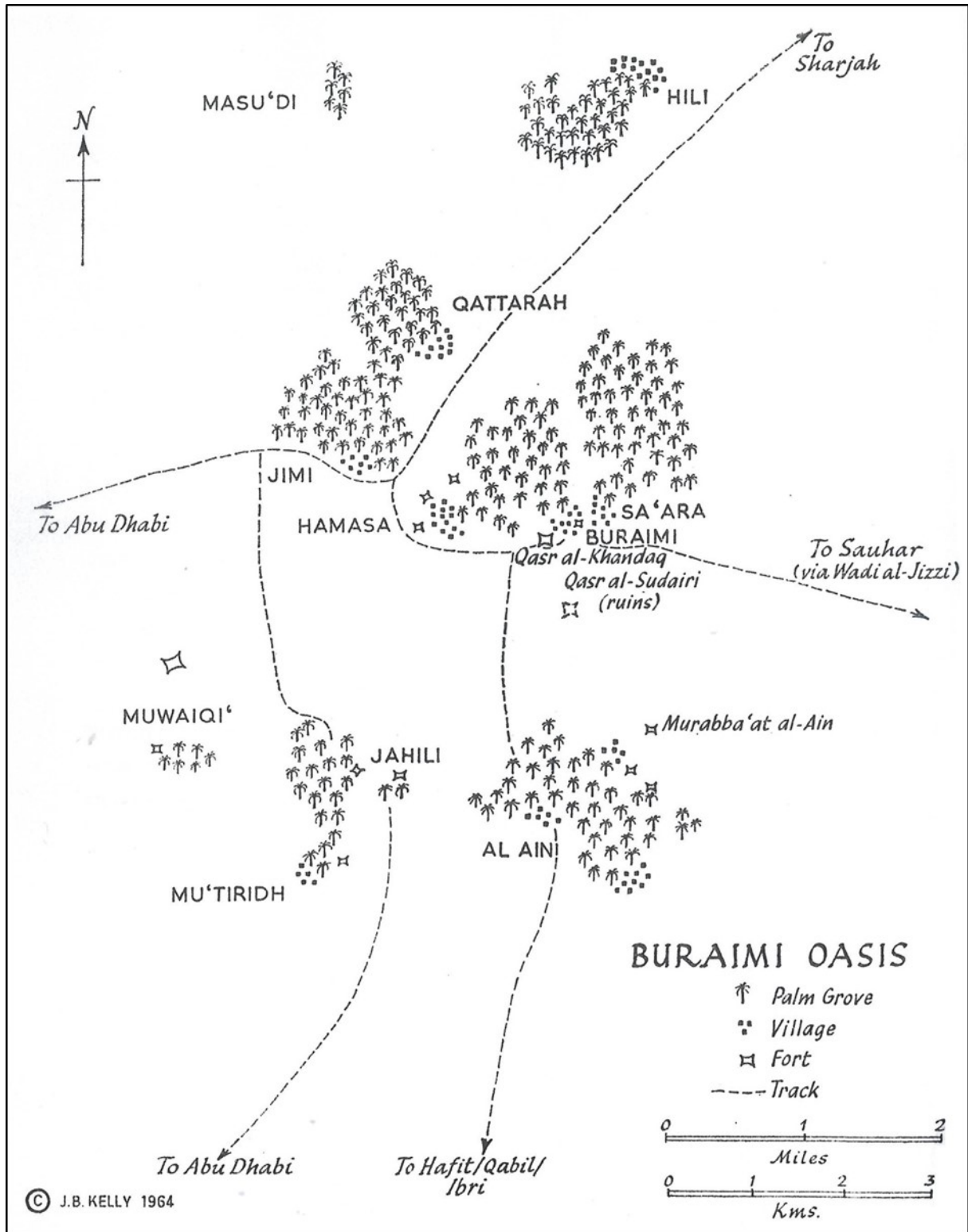


Fig. 1.4 – Anonymous aerial photograph of Buraymi and Sa'ara taken in the 1960s

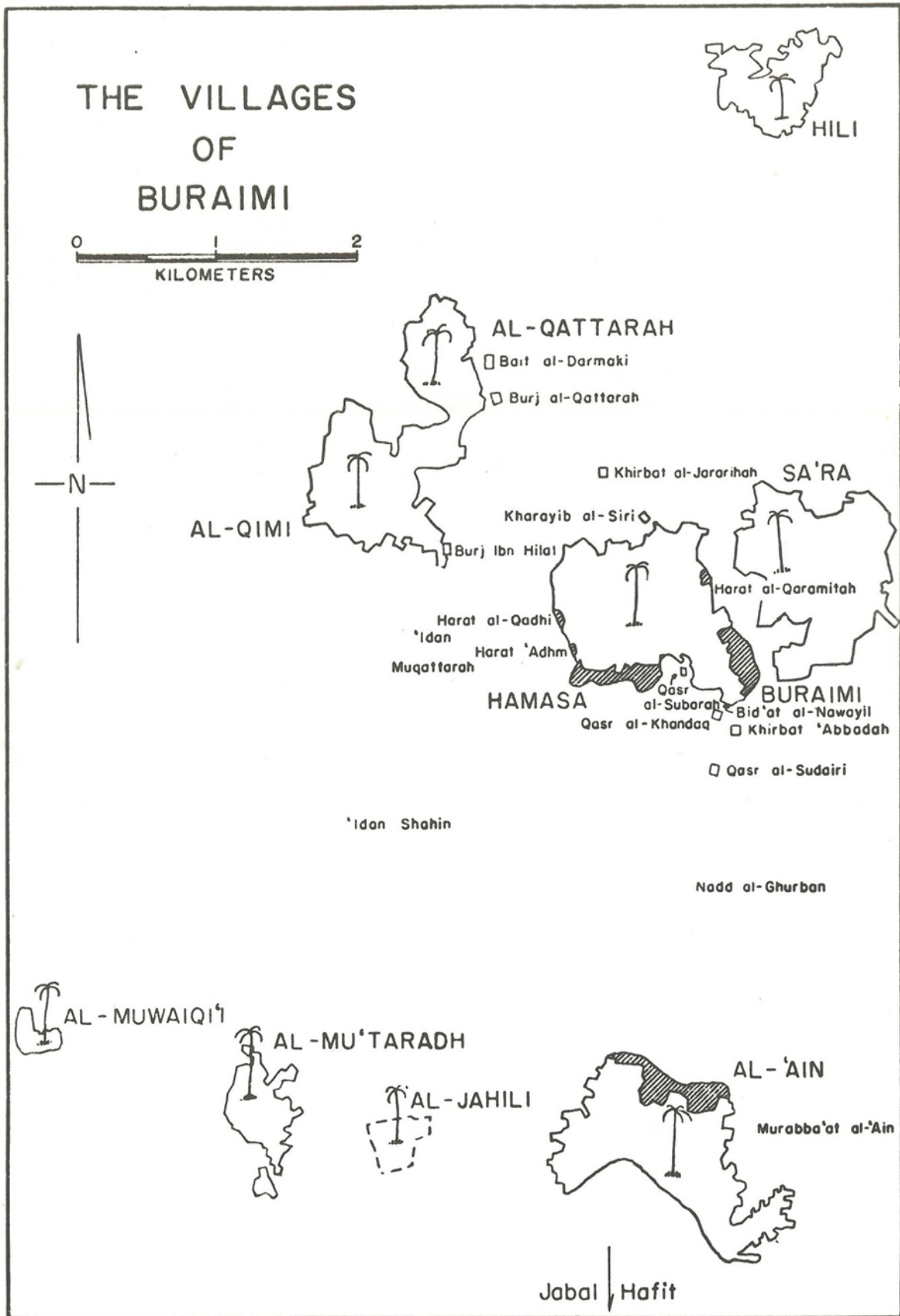


Fig. 1.7 – Sketch map of the situation at the time of the 'Buraymī Crisis'

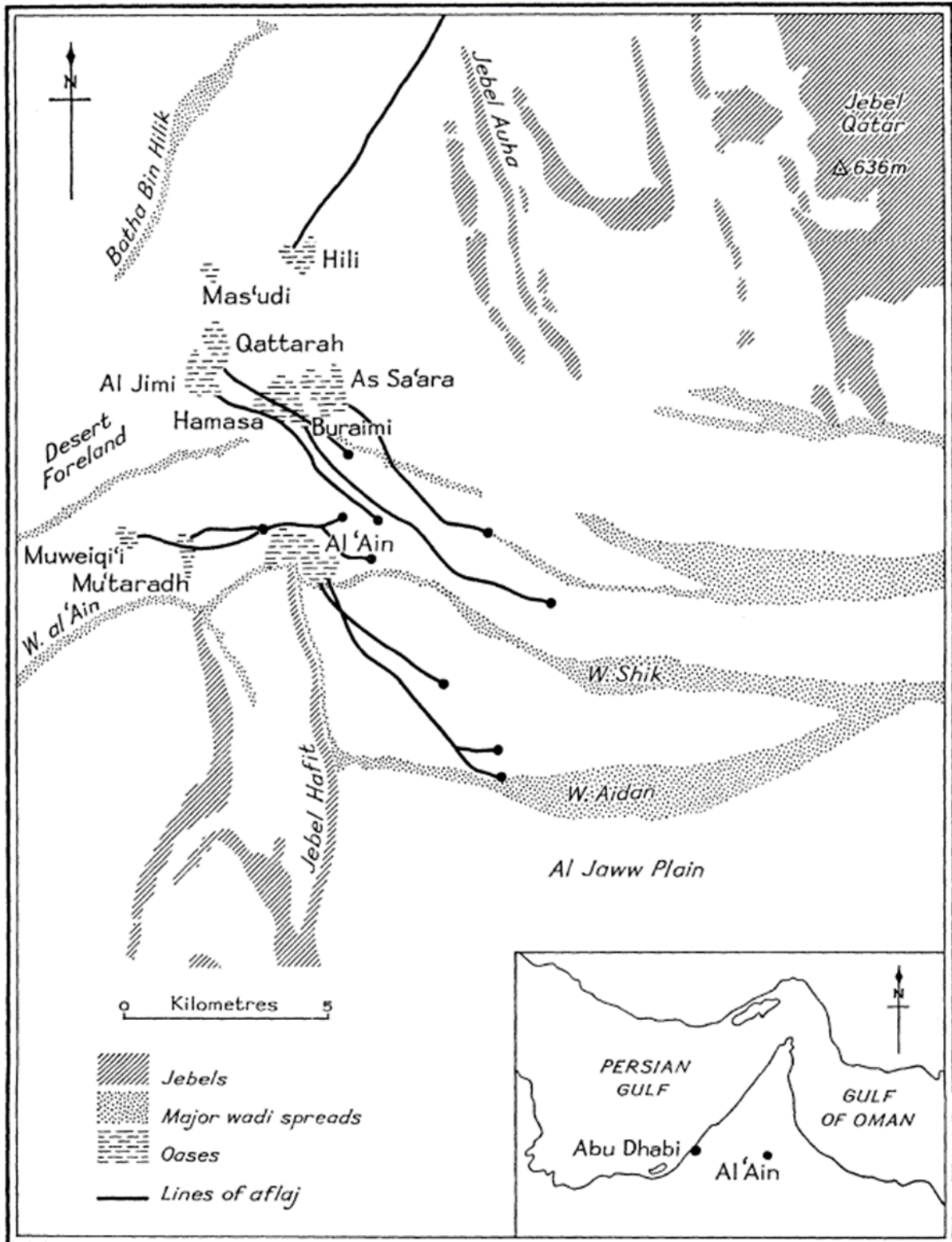


Fig. 1.7 – Sketch map of the situation at the time of the 'Buraymī Crisis'



FSBW	Fine Striated Buff Ware	WPORC	White Porcelain
PRBW	Perpendicular Rim Buff Ware	ENAM	Enamelled Porcelain
CSBW	Coarse Striated Buff Ware	CBW	Chinese blue-and-white
IBWS	Incised Buff WareS	BTVN	Batavian
JULFAR	Julfār Ware	TPWW	Transfer Printed White Ware
KHUNJ	Khunj / Bahlā Ware	WILLOW	Willow Pattern
GMONO.2	Green Monochrome Glazed Ware	PPWW	Polychrome Painted White Ware
REDYEL	Red-Yellow Glazed Ware	JCCC	Japanese / Chinese Coffee Cups
MGPAINT.2	Underglaze Painted Manganese Purple	CHING	Kitchen 'Ching'
MMA	Modern Mugs & Plates		

Fig. 1.9 – Late Islamic ceramics typical of the al-Ayn / Buraymī Oases
(Power & Sheehan, 2012: Fig. 4)

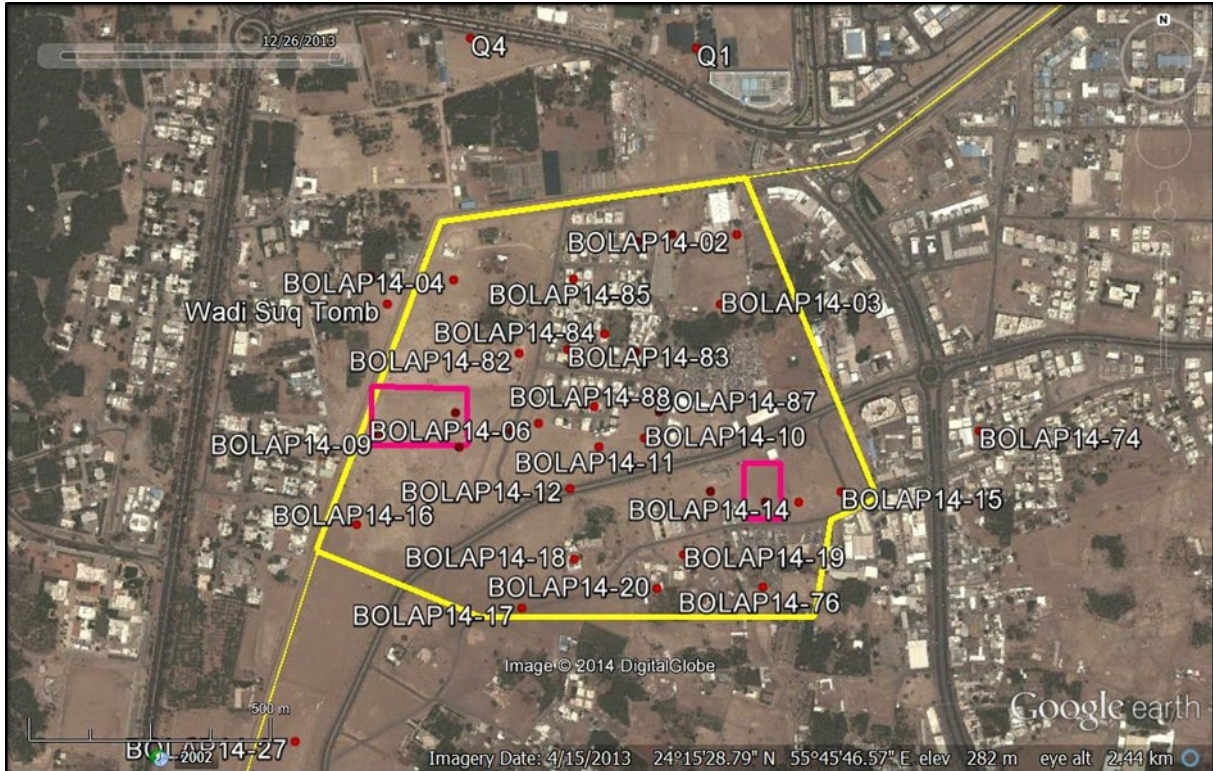


Fig. 2.1 – The northern survey area showing locations of sites and features

Fig. 2.2 – The northern survey area and sites superimposed on the 1968 RAF photograph

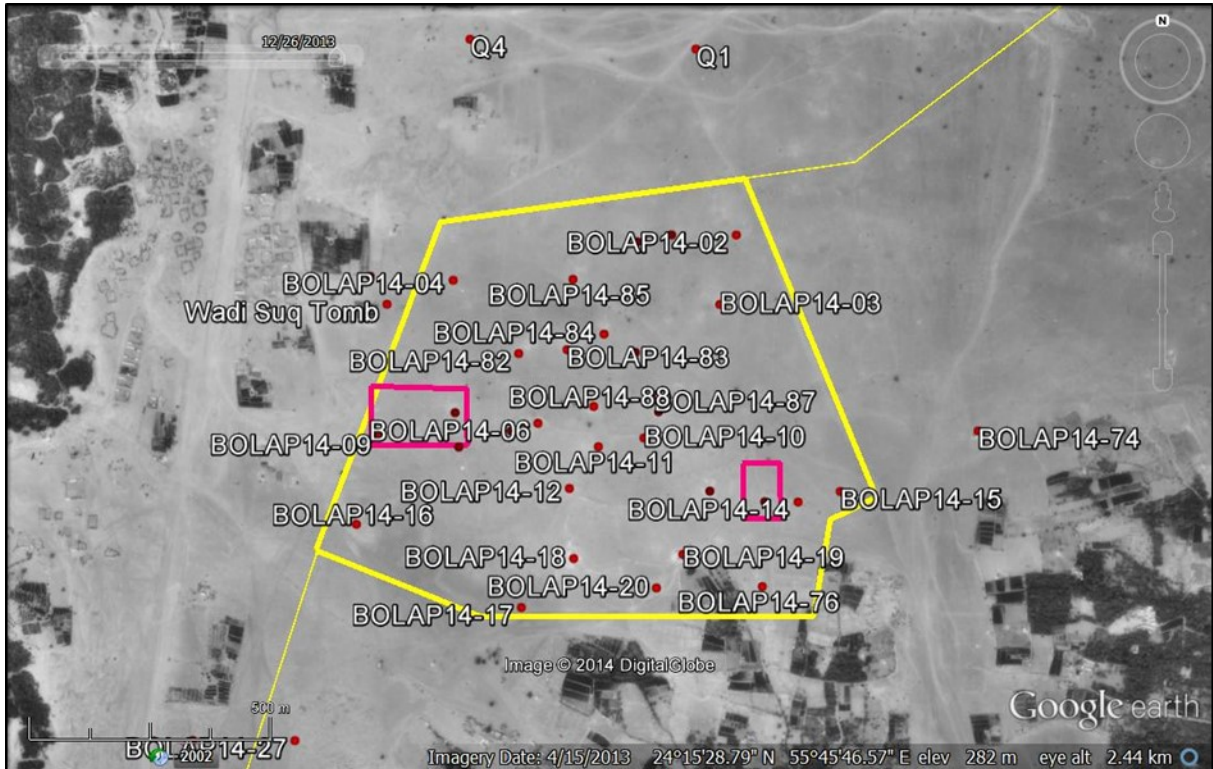
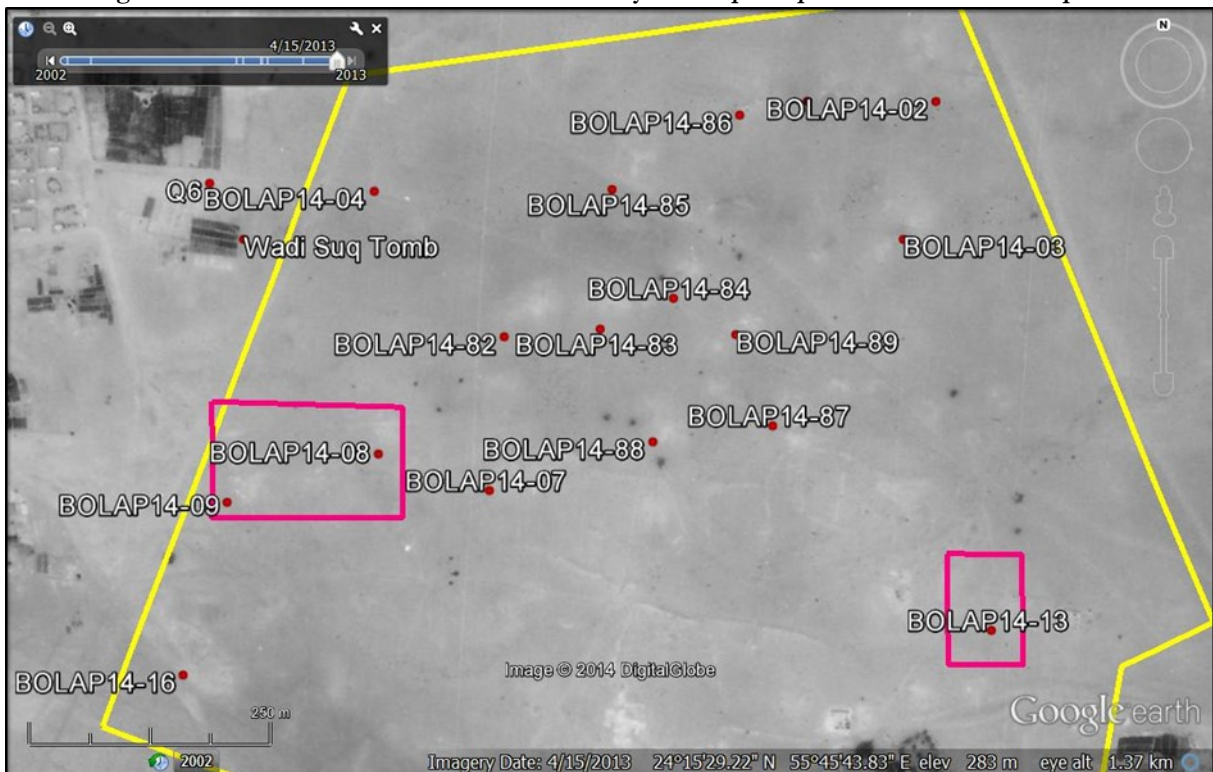




Fig. 2.3 – Pre-Islamic sites in the northern survey area

Fig. 2.4 – Pre-Islamic sites in the northern survey area superimposed on the 1968 RAF photo



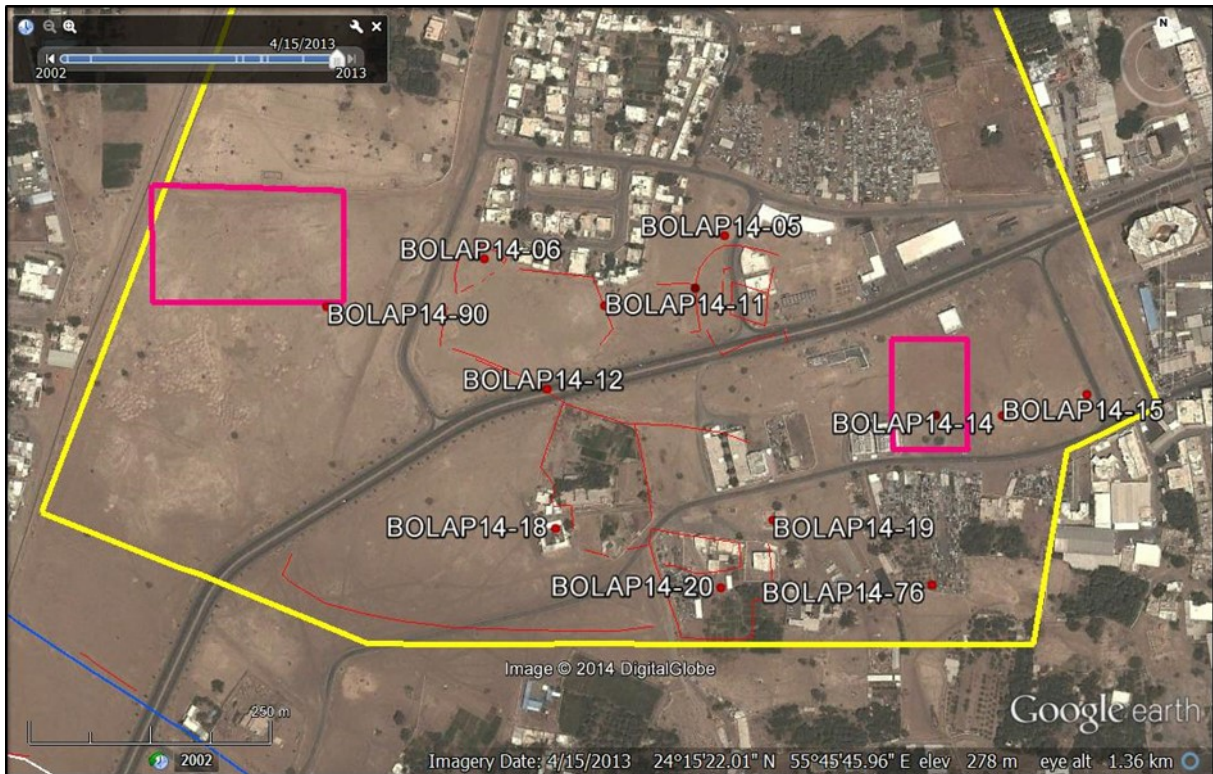
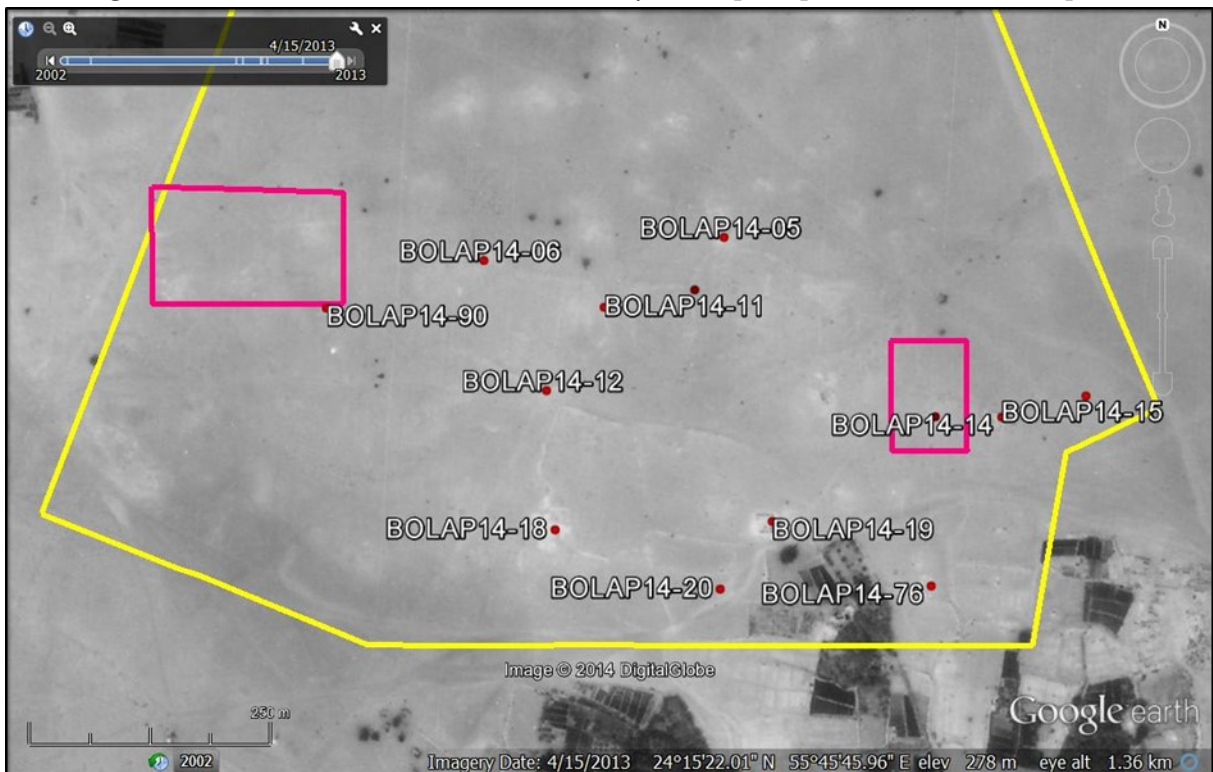


Fig. 2.5 – Late Islamic sites in the northern survey area

Fig. 2.6 – Late Islamic sites in the northern survey area superimposed on the 1968 RAF photo



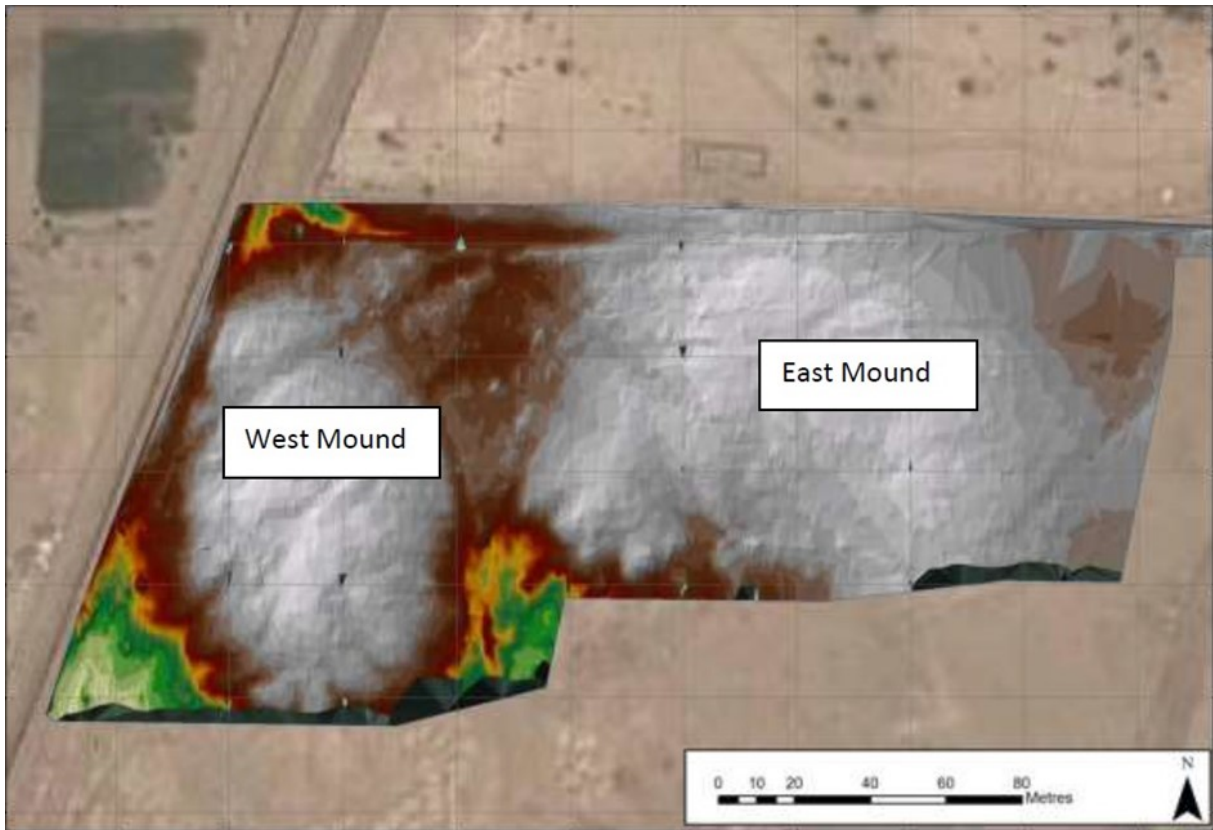
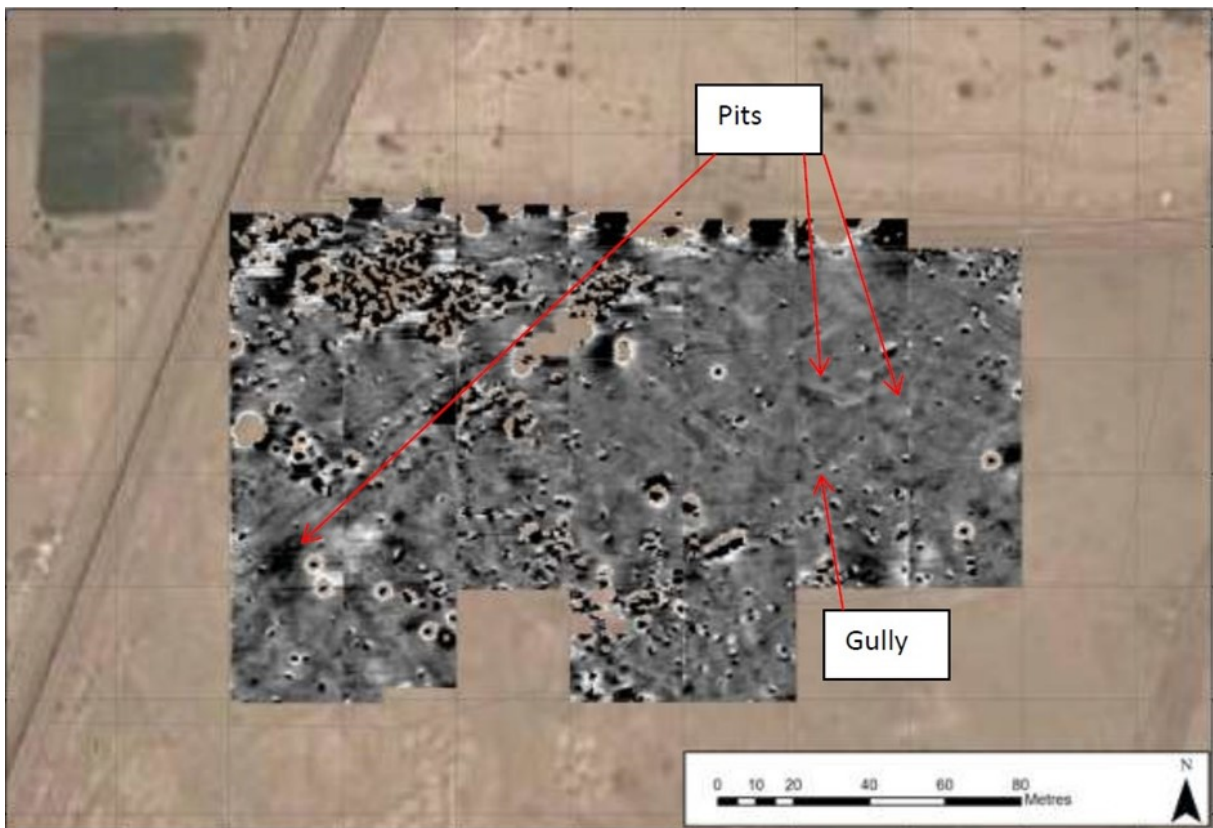


Fig. 2.7 – Topography survey of Iron Age mounds BOLAP14-08 (E) & BOLAP14-09 (W)

Fig. 2.8 – Magnetometric survey of Iron Age mounds BOLAP14-08 & BOLAP14-09



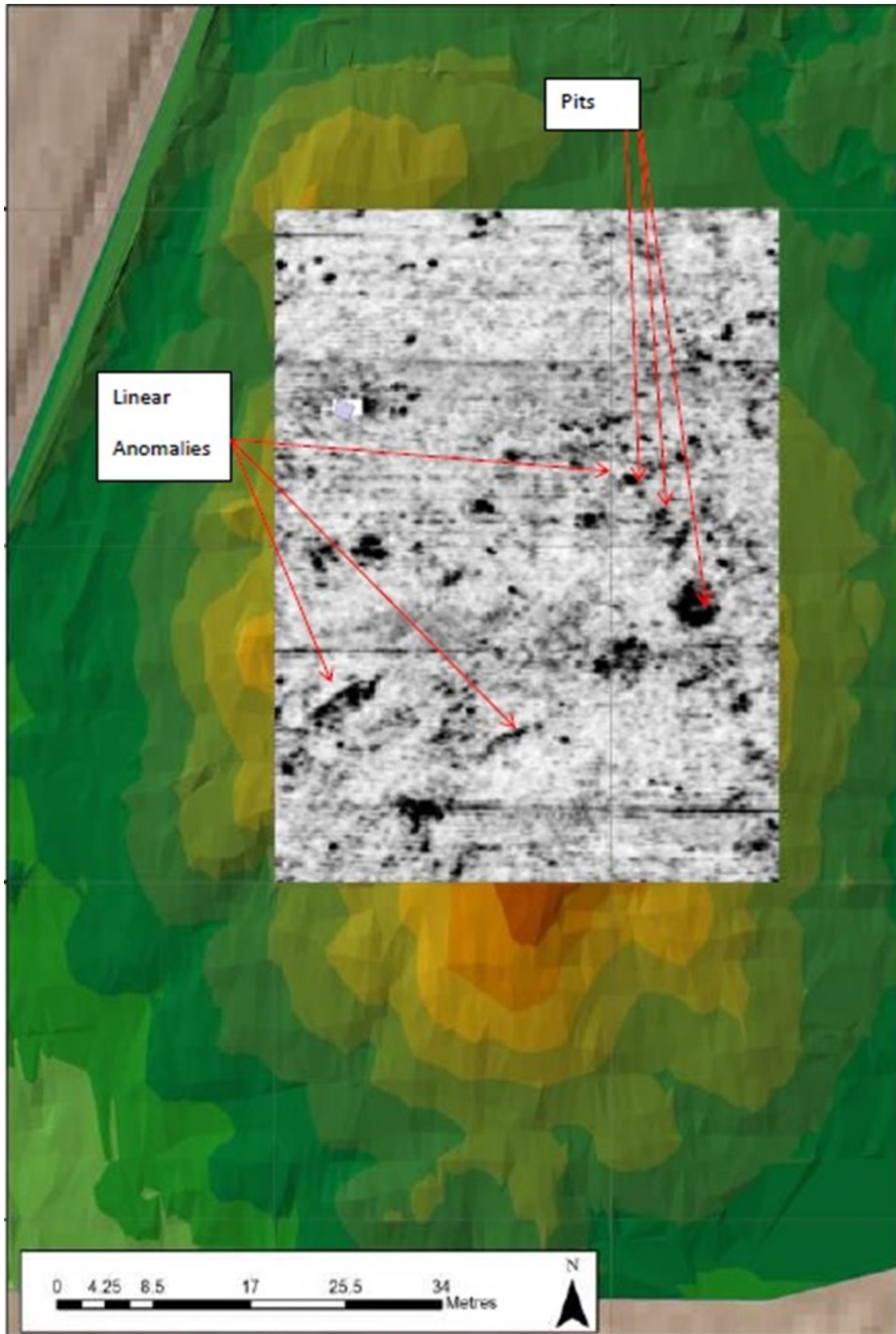


Fig. 2.9 – GPR survey of Iron Age mound BOLAP14-09

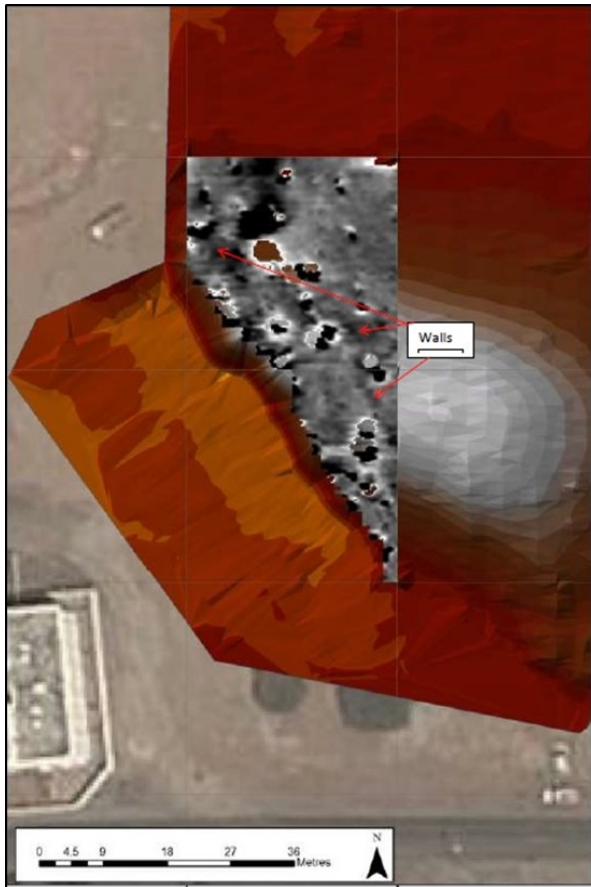


Fig. 2.10 – Magnetometer BOLAP14-13

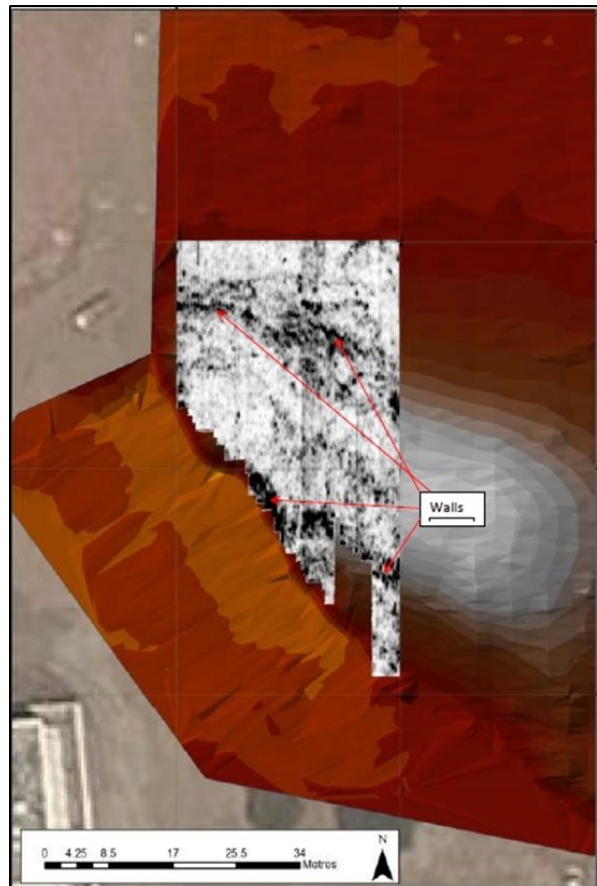


Fig. 2.11 – GPR BOLAP14-13



Fig. 2.12 – Selected ceramic sherds from field walking Grid Square 2 at BOLAP14-09

Fig. 2.13 – Selected ceramic sherds from field walking Grid Square 5 at BOLAP14-09





Fig. 2.16 – Selected ceramic sherds from field walking Grid Square 15 at BOLAP14-09

Fig. 2.17 – Steatite sherds and pottery from field walking Grid Square A at BOLAP14-09





Fig. 2.18 – Selected ceramic sherds from field walking Grid Square B at BOLAP14-09

Fig. 2.19 – Selected ceramic sherds from field walking Grid Square E at BOLAP14-09





Fig. 2.20 – Selected ceramic sherds taken from section context (005) at BOLAP14-13



Fig. 2.21 – Selected ceramic sherds taken from surface context (001) at BOLAP14-13

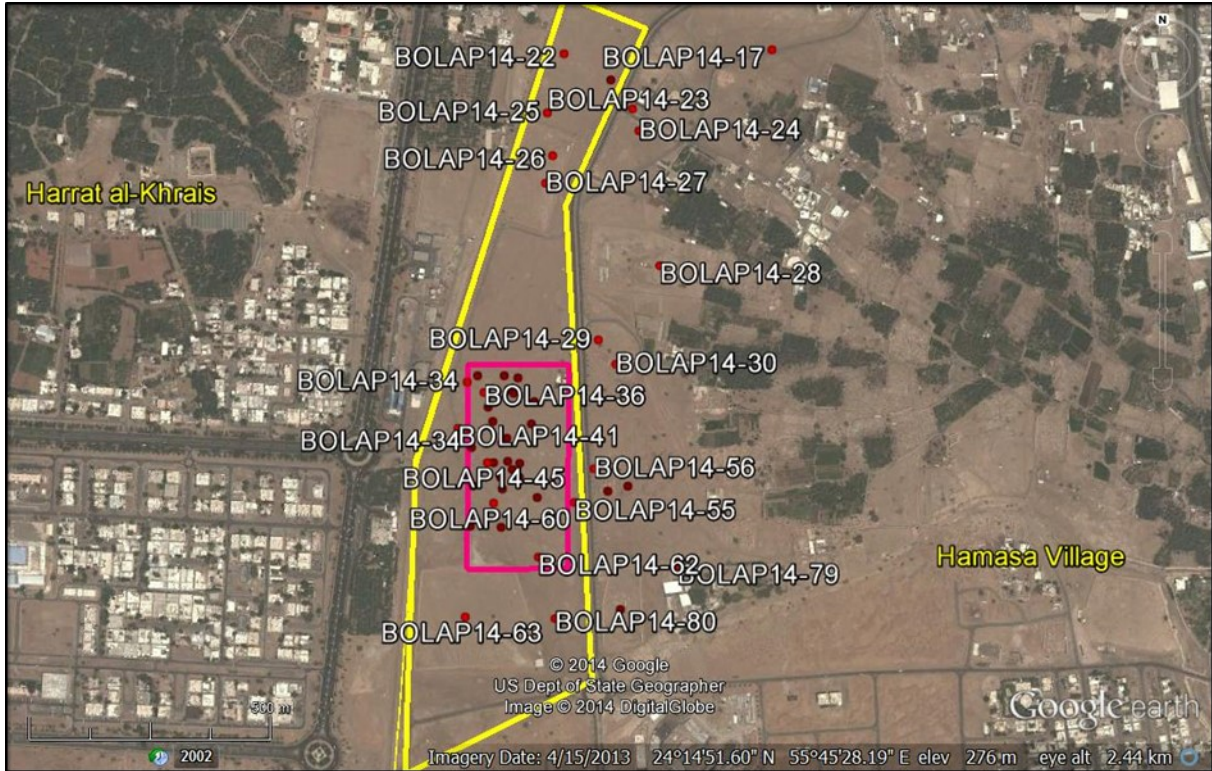
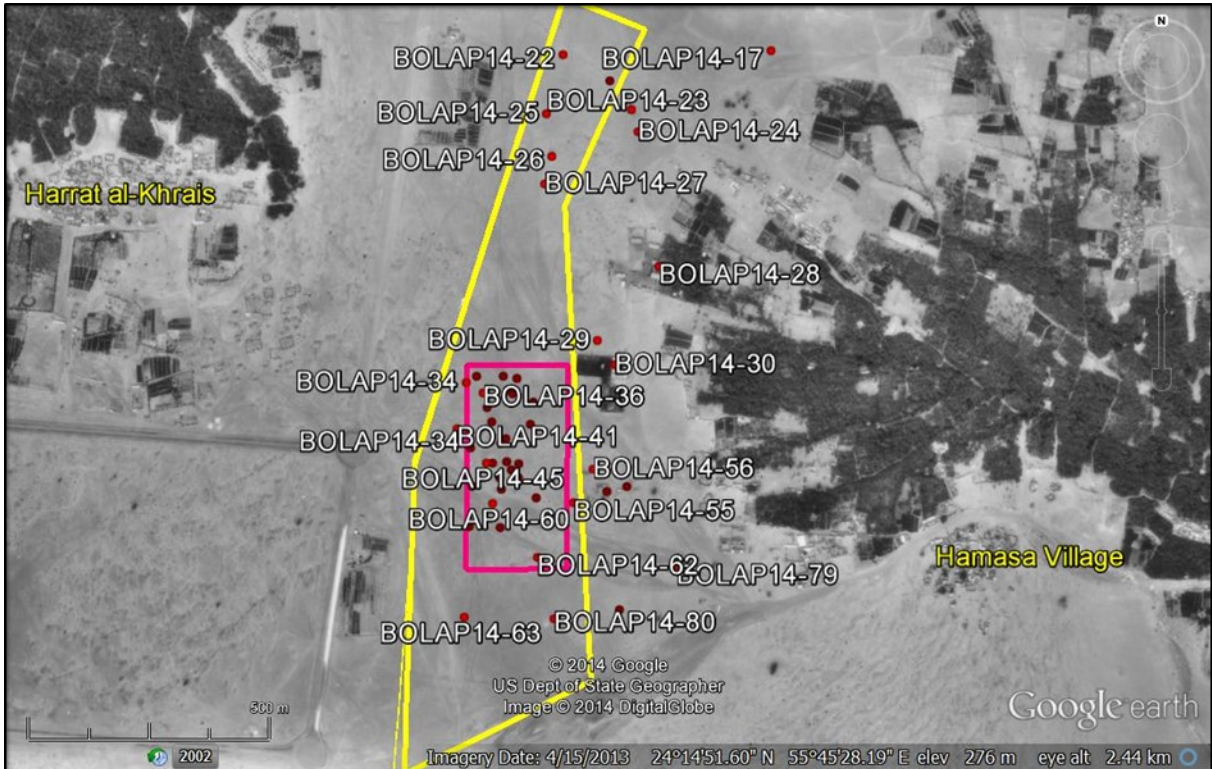


Fig. 3.1 – The central survey area showing locations of sites and features

Fig. 3.2 – The central survey area and sites superimposed on the 1968 RAF photograph



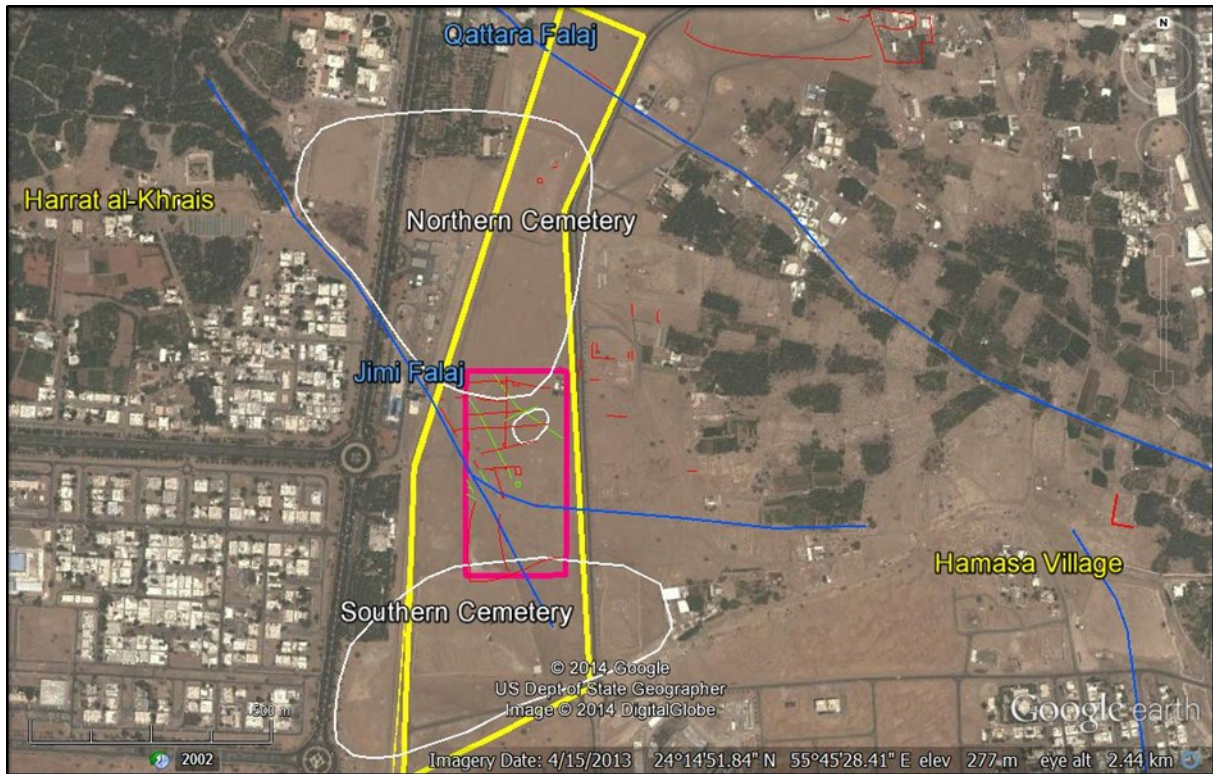
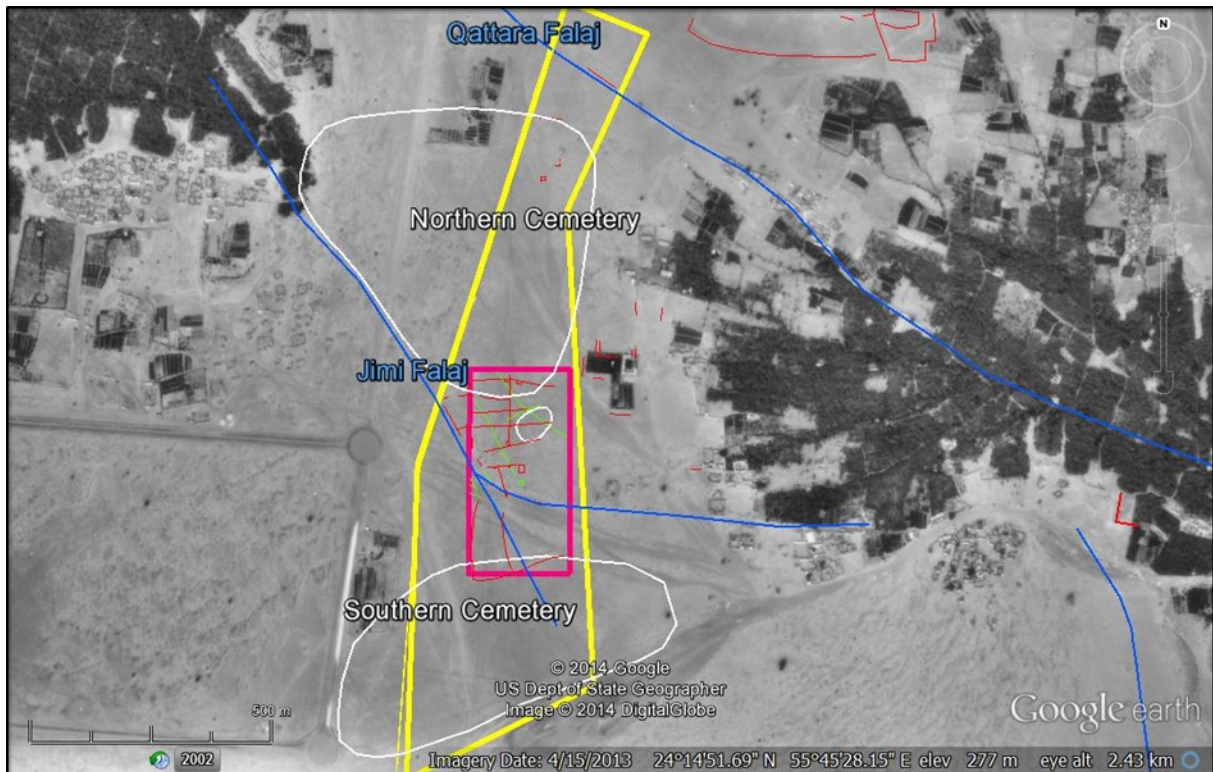


Fig. 3.3 – The central survey area showing drawn features

Fig. 3.4 – The central survey area showing drawn features superimposed on 1968 RAF photo



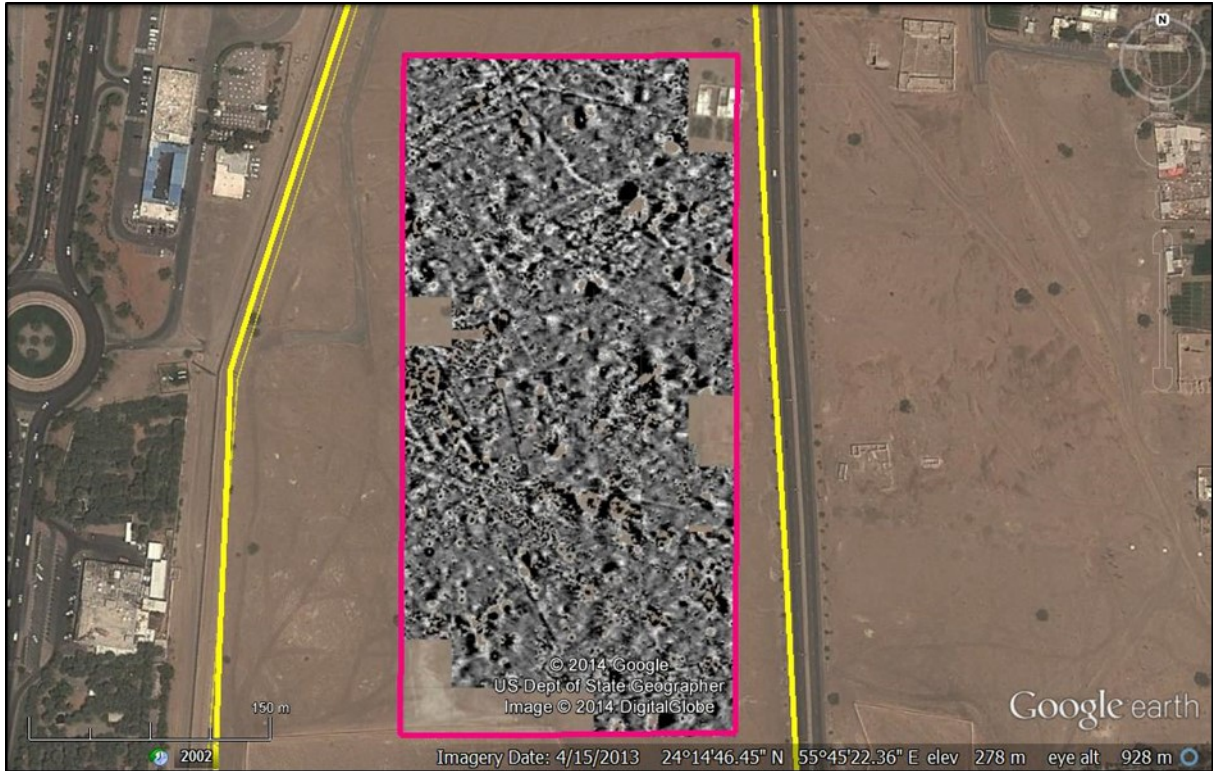


Fig. 3.5 – The magnetometric survey in the central survey area

Fig. 3.6 – The magnetometric survey in the central survey area with drawn features



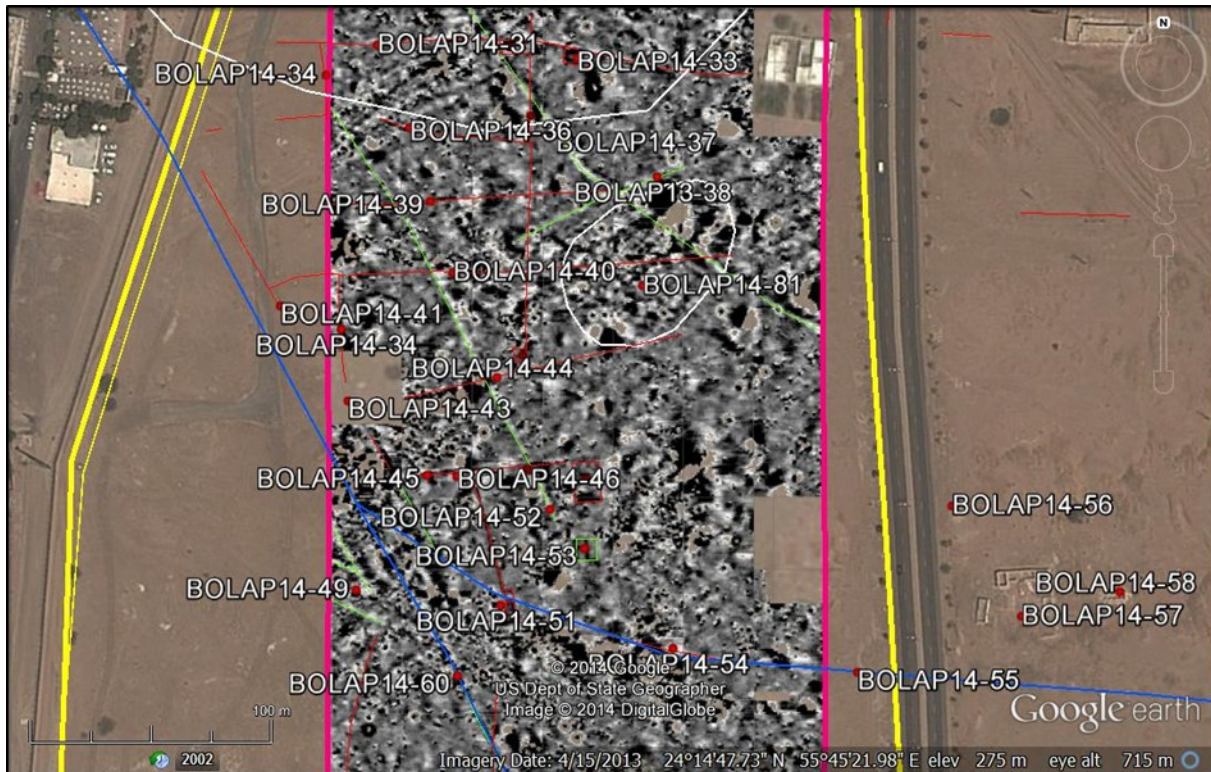
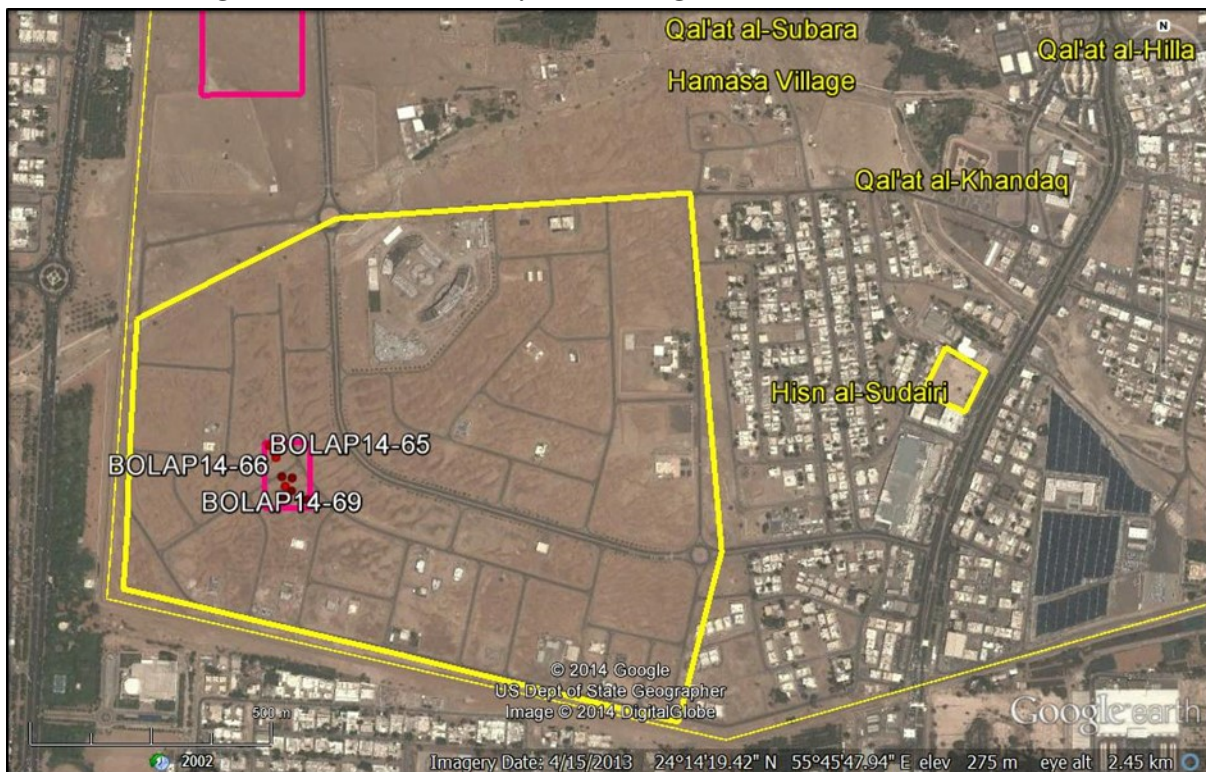


Fig. 3.7 - Magnetometric survey with drawn features and BOLAP14 features

Fig. 4.1 – The southern survey area showing locations of sites and features



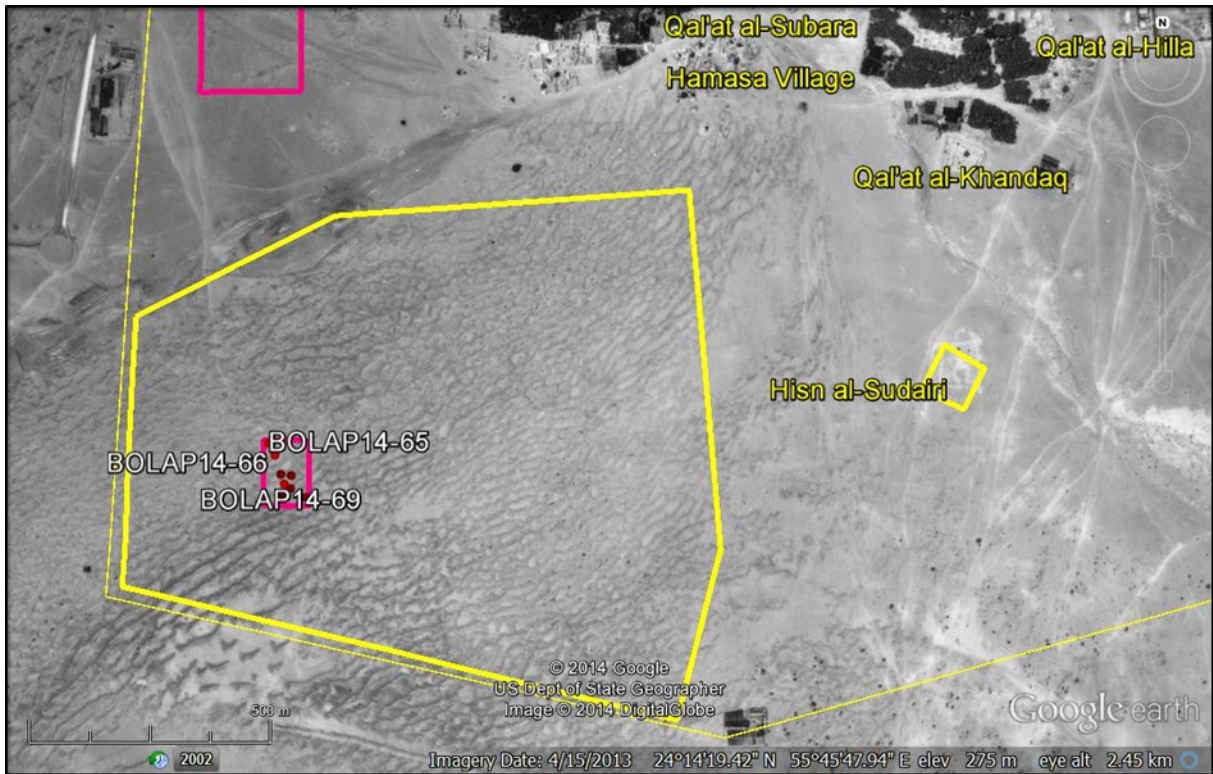
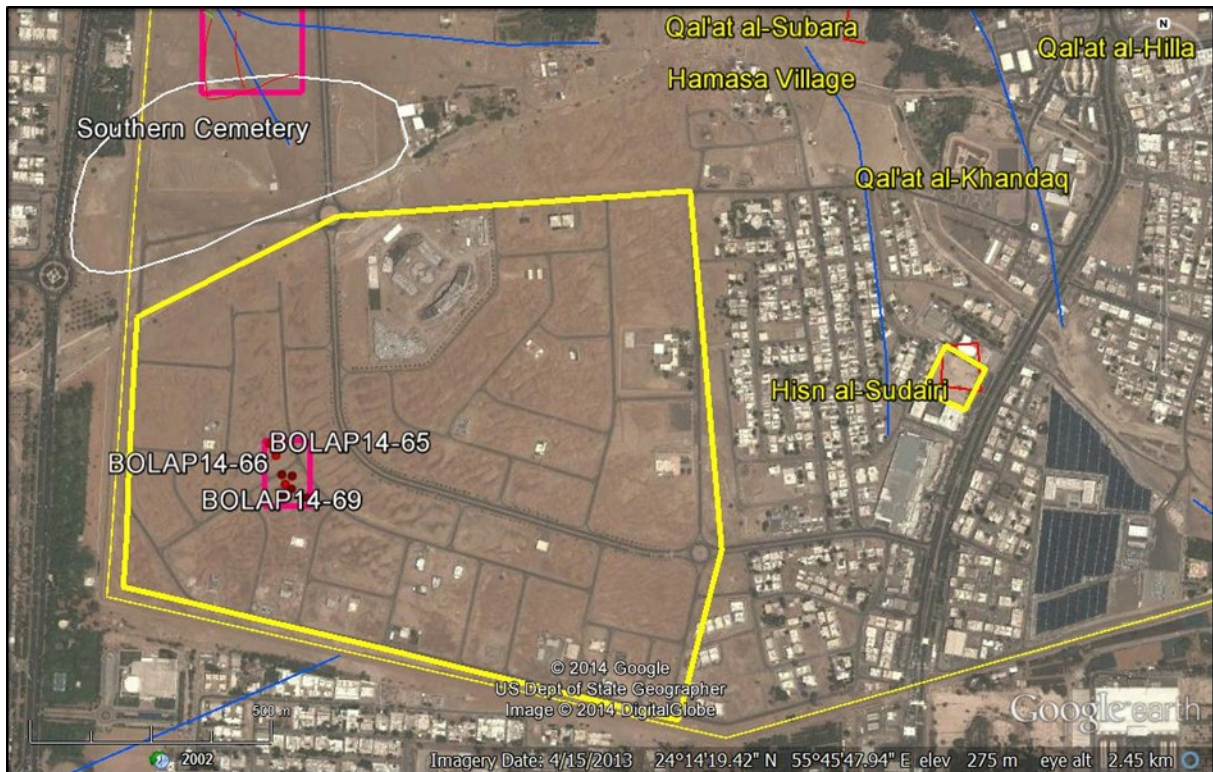


Fig. 4.2 – The southern survey area and sites superimposed on the 1968 RAF photograph

Fig. 4.3 – The southern survey area showing drawn features



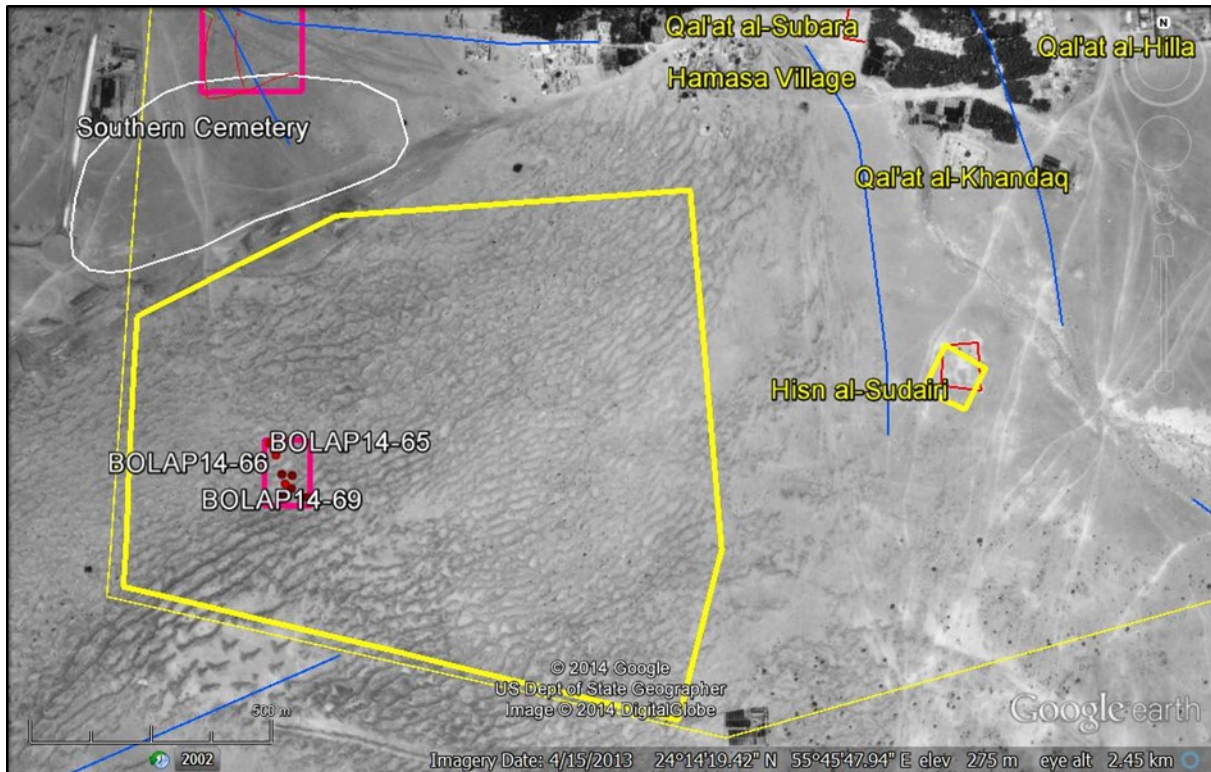
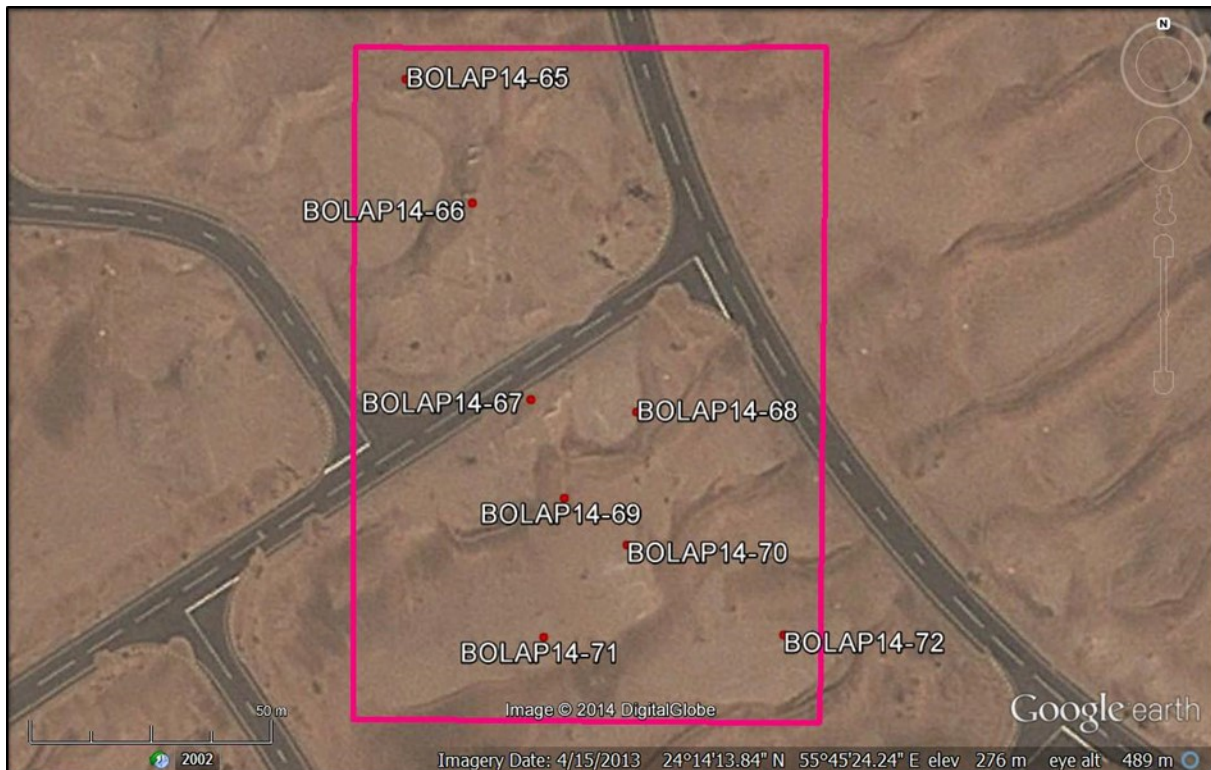


Fig. 4.4 – The southern survey area showing drawn features on the 1968 RAF photo

Fig. 4.5 – Early Islamic buildings documented in the southern survey area



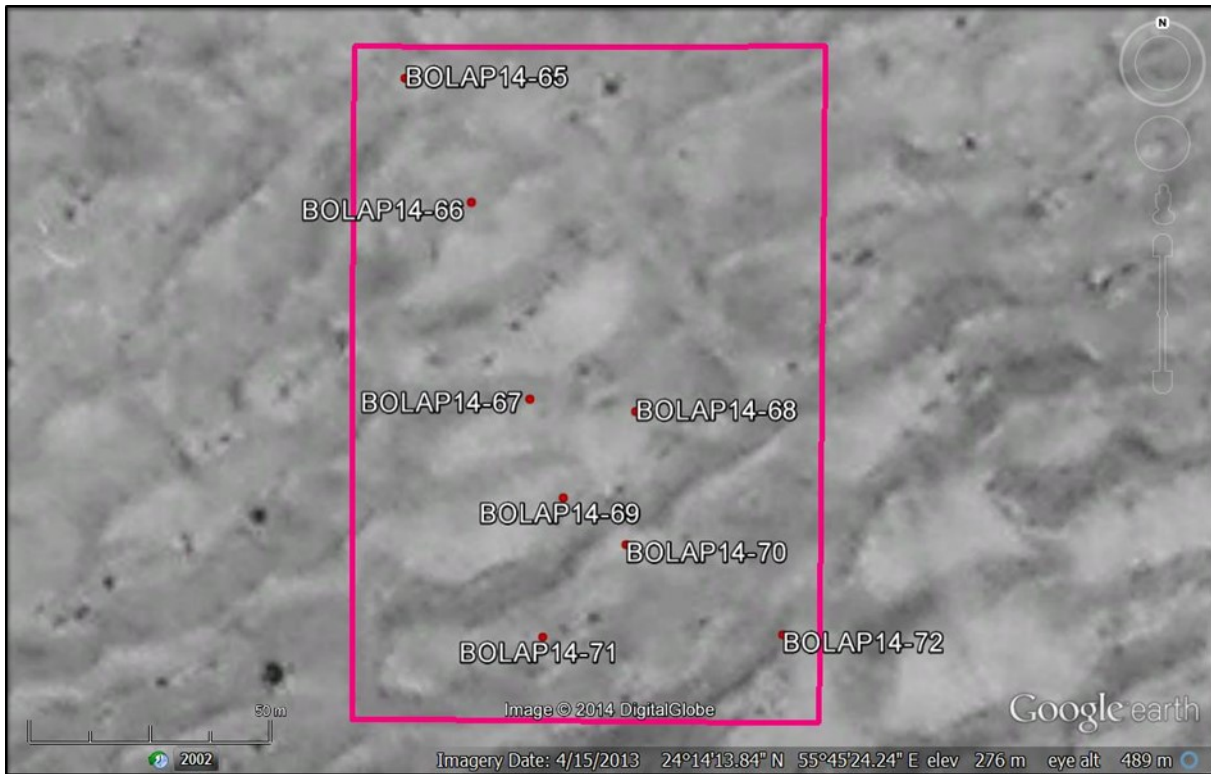


Fig. 4.6 – The Early Islamic buildings do not appear in the 1968 RAF photo

Fig. 4.7 – Early Islamic buildings surveyed with backpack GPS and GPR

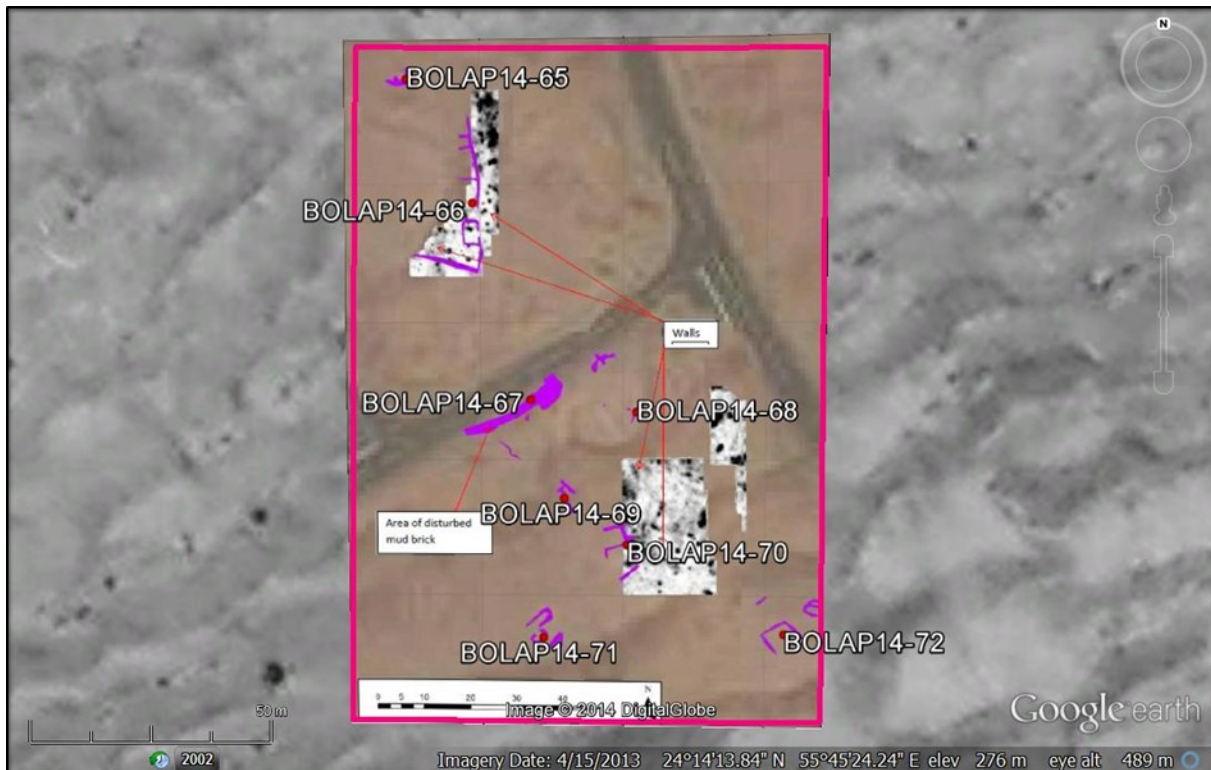




Fig. 4.8 – Collecting surface ceramics near Early Islamic buildings BOLAP14-66

Fig. 4.9 – Turquoise alkaline glazed sherds from the surface of BOLAP14-66

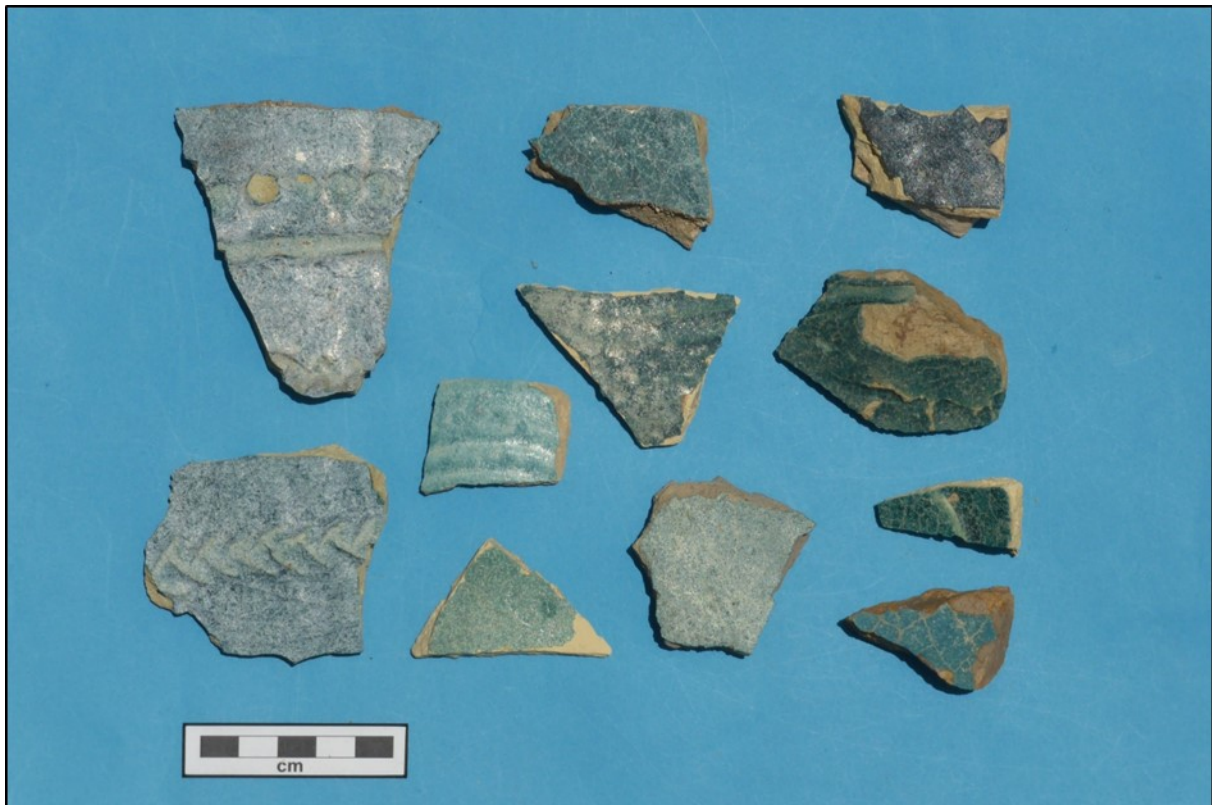




Fig. 4.10 – Traces of turquoise glaze on the interior only. From the surface of BOLAP14-66

Fig. 4.11 – Opaque white tin glazed sherds some with blue or brown inglaze decoration





Fig. 4.12 – Miscellaneous glazed sherds from the surface of BOLAP14-66

Fig. 4.13 – ‘Eggshell Ware’ (Kūfa Jugs) from the surface of BOLAP14-66





Fig. 4.14 – Large incised storage jars and proto Julfār Ware from the surface of BOLAP14-66