

پروژہی شوینہواری گردی مہتراب

Girdi Matrab Archaeological Project (GMAP)

2022 Season Final Report

21 August - 10 October

Submitted by Dr. Rocco Palermo (University of Pisa) - Project Director

(with contributions by Dr. Nathalie Brusgaard and Mr. Jordan Brown)



UNIVERSITÀ DI PISA

1. Introduction

The first season of the Girdi Matrab Archaeological Project was carried out between August 21 and October 10. The fieldwork team was composed by the following members:

Dr. Rocco Palermo, University of Pisa (Italy), *Project Director*
Dr. Nathalie Brusgaard, University of Groningen (Netherlands), *Zooarchaeologist*
Dr. Aila Santi, SOAS London (UK), *Archaeologist*
Dr. Valentina Grasso, Catholic University of America (USA), *Archaeologist*
Ms. Lara Pucci Daniele, University of Pisa (Italy), *Archaeology Student*
Mr. Parsa Kheirandish, University of Pisa (Italy), *Archaeology Student*
Mr. Michele La Porta, University of Pisa (Italy), *Archaeology Student*
Mr. Gabriele Viola, University of Pisa (Italy), *Post-Graduate Student in Archaeology*

Mr. Jordan Brown, University of Berkeley (USA), team member of the Erbil Plain Archaeological Survey, conducted geoarchaeological samplings at the site in the framework of his PhD research, aided - among others - by Mr. Jack Bishop (Harvard University) also a team member of EPAS.. Our 2022 Antiquities representative and collaborative team member was Mr. Ali Banishary. GMAP team would like to thank Ali for his logistical and scientific support to the project. Team was located in the Erbil neighborhood of Ainkawa where a project house and lab were also set up. Daily routine included the circa 45 minutes drive to the site, approximately 30 Kms South-East of Erbil. Field protocol included all team members going to the field in the morning. At the site GMAP team met with 5 workmen from the nearby village of Baqrta, hired for the whole period of excavation (August 24 to October 2):

Mr. Abdullah Hemdad
Mr. Dilman Abdullah
Mr. Mohammed Khalel
Mr. Qayis Mohammad
Mr. Hedy Ahmad

The GMAP team worked in the field from approximately 6 to 11.45 am, with a 30 minutes break around 9 am. Due to the house and office sharing situation with the Harvard team (EPAS, Erbil Plain Archaeological Survey) and the Emory University team (RLIIM, Rural Landscapes of Iron Age Imperial Mesopotamia) working hours in the field were reduced. Working hours will resume from 6 am to 1 pm in 2023.

2. Topography and Settlement History

Girdi Matrab is a multi-mounded site located circa 1.8 kms South-East of the village of Baqrta in the *nahyia* (district) of Shemamok, circa 30 kms South of the Kurdistan Region capital of Erbil. The site was first identified by the EPAS team in 2012 and then labeled as Site 6 on their gazetteer. In 2019 Mr. Mohammed Lashkri from the General Directorate of the Antiquities of the KRG identified the site on a 1946 cadastral map, where it was listed as Girdi Matrab (roughly translated as “the dusty mound” in Kurdish).

The site shows a unique topography as it is composed of 5 low mounds orbiting around a major central one (Mound 1). The morphological aspect is possibly due to the presence of a *wadi* to the East of Mound 2 whose course might have shifted from the West through time. EPAS team first visited the site in 2012 identifying 6 collection units, each one corresponding to the visible mounds. The analysis of the surface artifacts produced a quite reliable settlement history. Girdi Matrab started to be occupied in the Late Chalcolithic period and the site survived into the Northern Uruk phase. At the end of the 4th millennium BC the site was probably abandoned and never re-occupied until the late Iron

Age, although the surface evidence yielded signs of a scattered occupation. Starting from the second half of the 1st millennium BC the site seems to have been intensively settled, covering during the Hellenistic period (late 4th - late 2nd c. BC) an area of approximately 20 hectares. Growth and expansion continued into the Parthian period (late 2nd c. BC - early 3rd c. AD). Girdi Matrab was then abandoned sometime at the beginning of the 1st millennium AD and never re-occupied again. Prior to the beginning of the excavation an intensive, grid-based survey was carried out in 2020 by the Kurdish members of EPAS. More than 6.000 artifacts (mostly potsherds) were counted and 1100 of them were carefully analyzed by project director Rocco Palermo in 2021. The intensive survey confirmed the periods of occupation established by EPAS, but also provided very good information about the settlement location within the site area through history. Prehistoric Matrab was concentrating mostly between Mound 1, 3 and 4, while Hellenistic and Parthian Matrab expanded to cover the remaining ones.

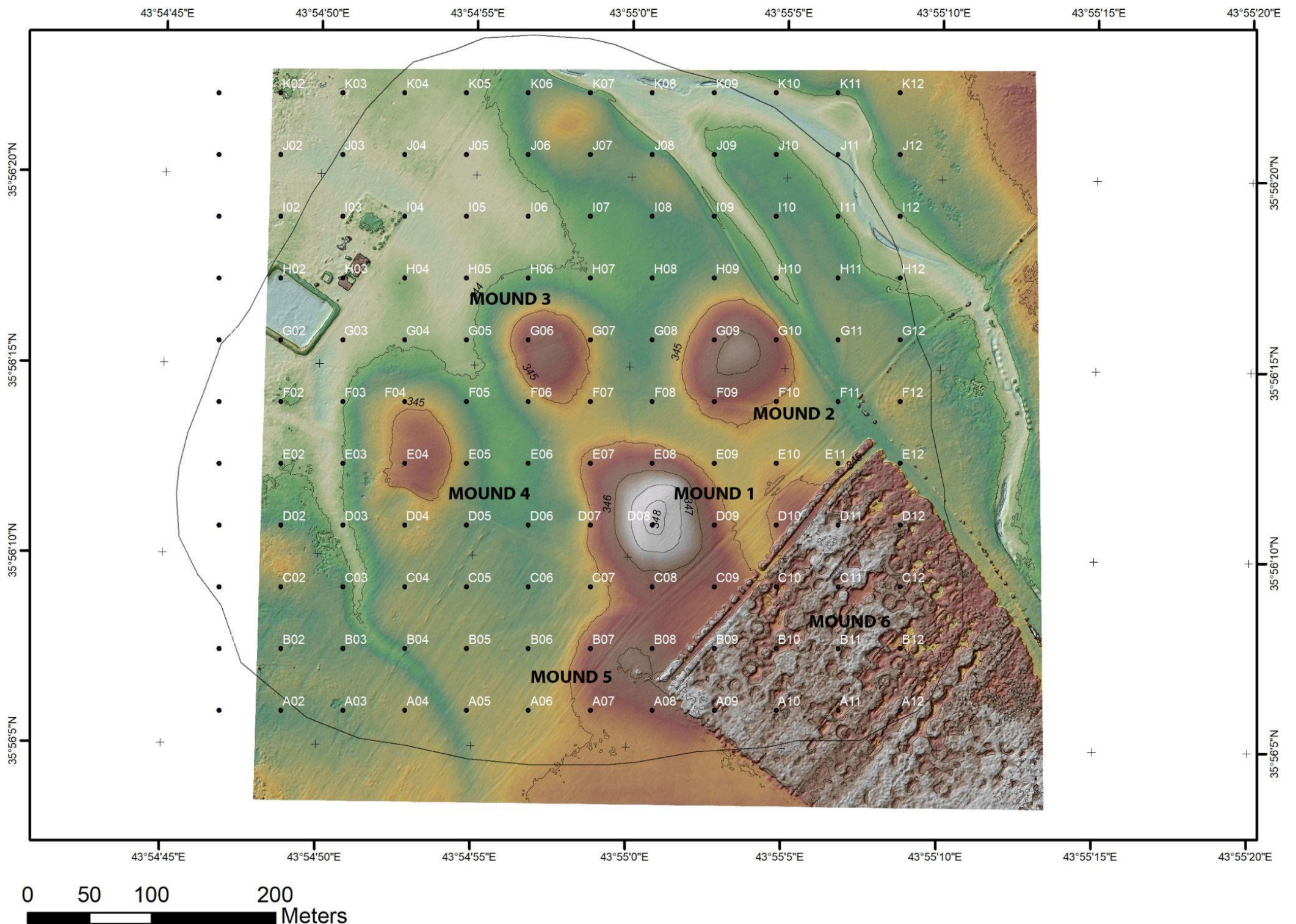


Fig. 1. Drone Derived DEM (Digital Elevation Model) of Girdi Matrab with the indication of the mounds.

3. Objectives and Results

The main goal of the season was to ground truthing the anomalies that were identified in 2021 during the Geophysical campaign carried out in collaboration with Dr. Petra Creamer (then at Dartmouth College, USA now at Emory University, USA). Magnetometer data showed traces of a large multi-room building approximately located in correspondence of Mound 2. Results and methodology employed during the geophysical investigations at Girdi Matrab were extensively discussed in the Erbil Plain Archaeological Survey Final Report of 2021 and they will not be replicated here.

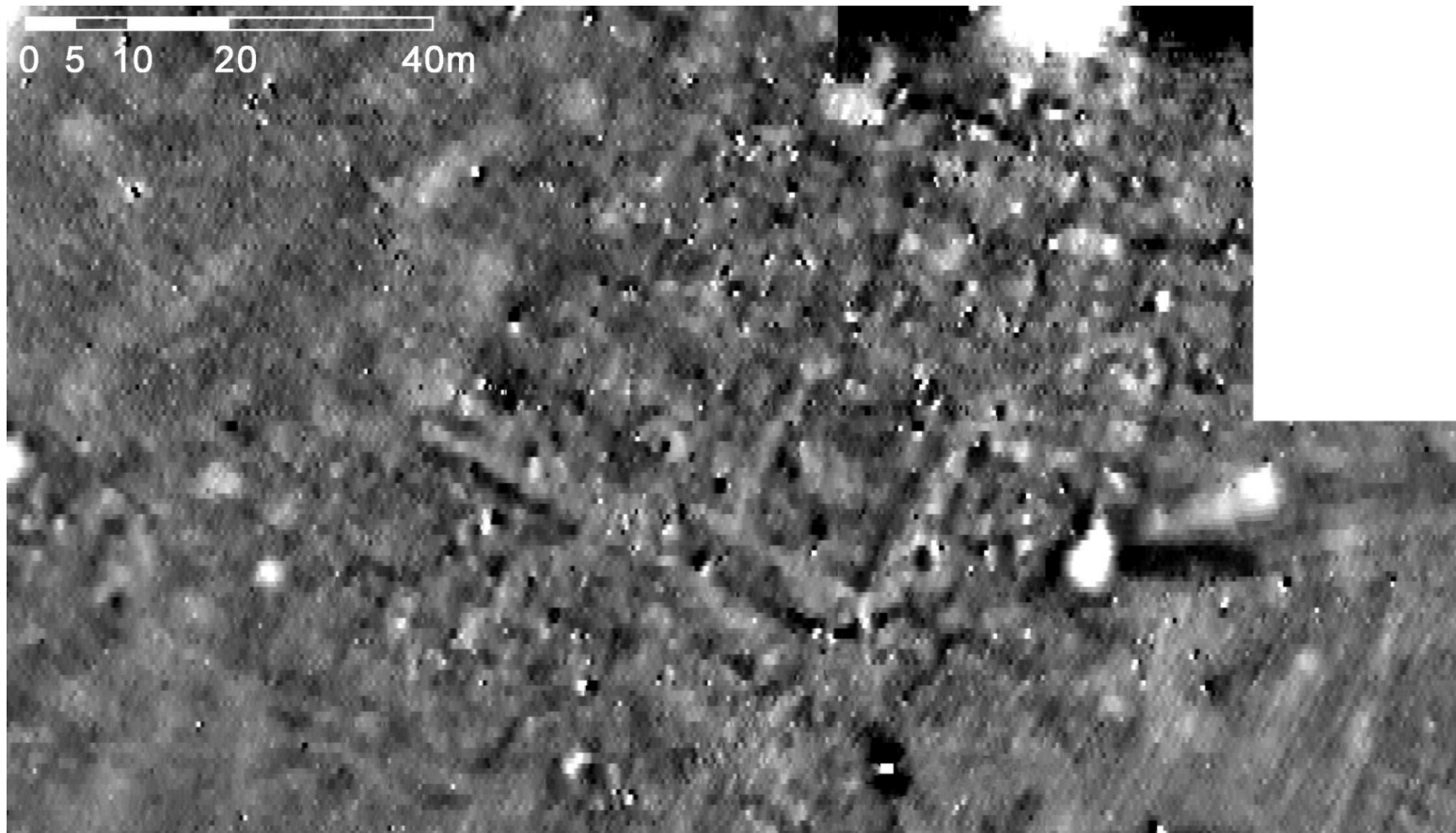


Fig. 2. Magnetometry data at Girdi Matrab. Data elaboration by Petra Creamer (Emory University).

On the basis of this sub-surface evidence the GMAP team opted for the opening of a single trench - Area A - rescheduling the excavation of a step-trench on Mound 1 to the 2023 field season. Considering the extent of the magnetic evidence it was decided to plan a multi-year investigation of the area. An initial 20 x 25 m grid was set up over the potential structures in the South-Eastern part of the sub-surface evidence. Points were laid out using an Emlid Reach Differential GPS with real-time correction (RTK), kindly provided to the project by Risviel SRL, an Erbil-based GIS Consultant Company directed by Dr. Ulderico Sicilia, to whom go our deepest thanks. The 2022 excavation season focused on the eastern part of the grid, where a trench of ca. 10 x 6 m (118.20 square meters) was opened on the first day of excavation on August 24.

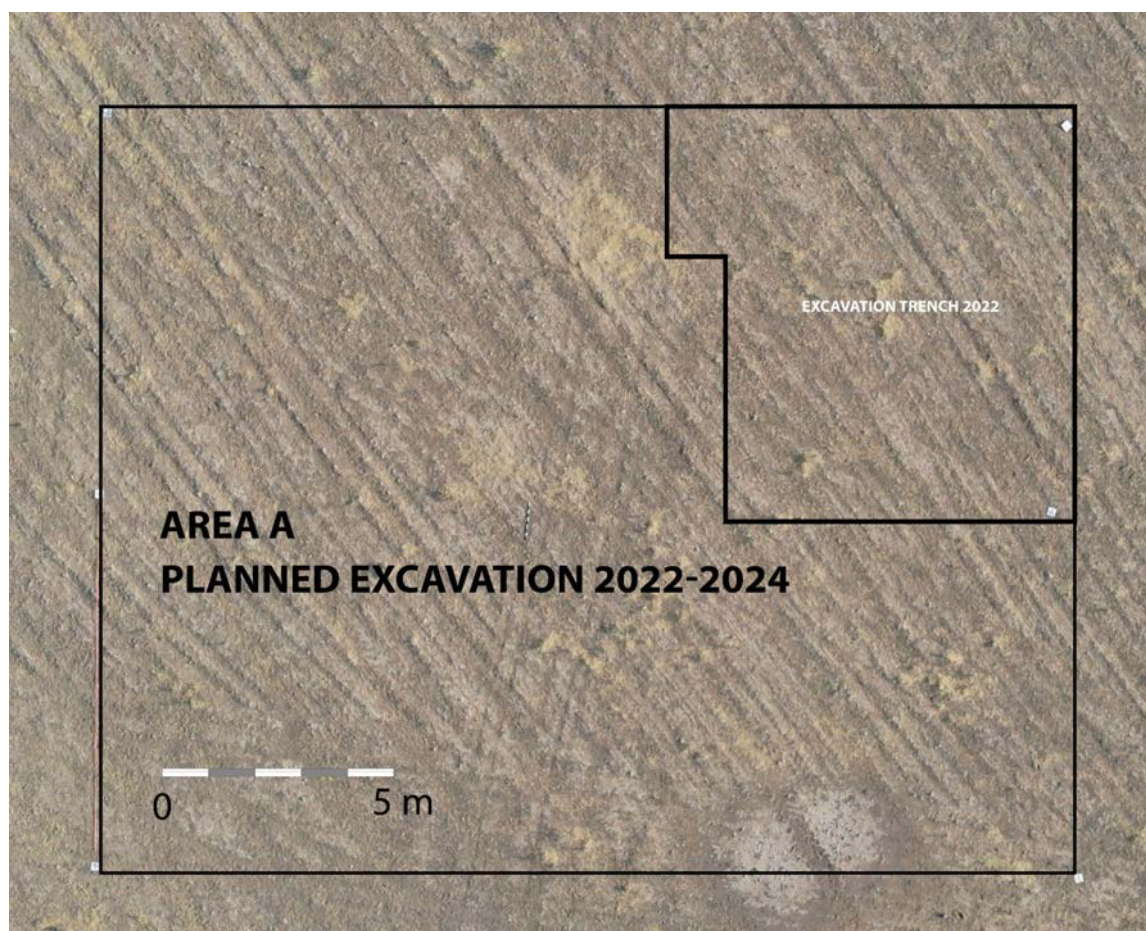


Fig. 3. Drone view of Area A prior to the 2022 investigation. Planned sectors and the 2022 trench are marked in the photo.

The excavation commenced with the scraping of the outermost agricultural soil. After the removal of grass and stones, the first sub-surface layer was identified. It consists of a grayish incoherent soil whose texture is massively affected by the longitudinal (NW-SE) modern and recent plow marks. A discrete amount of pottery sherds (> 1200 specimens) was collected during the digging operations to asport the surface level. Given the amount of work and man-labor that would have been required to excavate the entire area down to undisturbed layers, it was

decided to cut the trench in half along a N-S axis and work continued solely in the western part of the trench. Excavation of the eastern part of the trench will resume regularly in 2023.

After the removal of the surface layer, features and deposits of the so-called Phase A were exposed at an elevation of +351.45 ca, that is less than 20 cm below the topsoil. Because of this the positive units of this phase were severely affected by the presence of several foxholes and many sub-circular pits (1002; 1008; 1010; 1014) but our excavation succeeded in unearthing the remains of a mudbrick structure, possibly a room (1007, circa 3.85 m from W to E along 1005) of a building now completely below the northern section. It consisted of a long S-W oriented mudbrick wall (1005), closed to the West and East by two N-S mudbrick walls (1001 - 1.36 x 0.74 m - and 1006 - 1.39 x 0.80 m, respectively). All the walls of Room 1007 were poorly preserved and their mud bricks very crumbly. This is certainly due the fact that Room 1007 and its architectural features were incredibly close to the topsoil and hence more affected by phenomena of erosion through time. The associated floor of the room was not reached and probably was long gone due to the abovementioned natural phenomena. The fill of the room, whose southern wall has not been preserved, was however characterized by a thick, hard, whitish deposit (1004) which extended beyond the architectural features to almost cover the totality of the northern sector of the excavation trench.

The excavation of 1004 yielded a series of chronologically sensitive artifacts, among which some potsherds of the so-called Dog Tooth decorated ceramics, regionally codified as an unambiguous type for the Post-Assyrian and early Hellenistic period. Given the association of this type with purely Hellenistic period ceramics brought to light during the excavation of Phase A, it is tempting to - although preliminary - suggest a later temporal framework. In the western part of 1004, close to the western section of the trench, a relatively large pit (1015), filled with an incoherent, soft, gray terrain yielded a quite good amount of broken potsherds and animal bones (see dedicated section in this report).

In the Southern sectors of the excavation a large reddish soil deposit (1017) was uncovered. It consists of an almost artifact-void, hard, terrain with a coherent clay texture. Very few other inclusions (i.e. stones) were detected during the excavation.

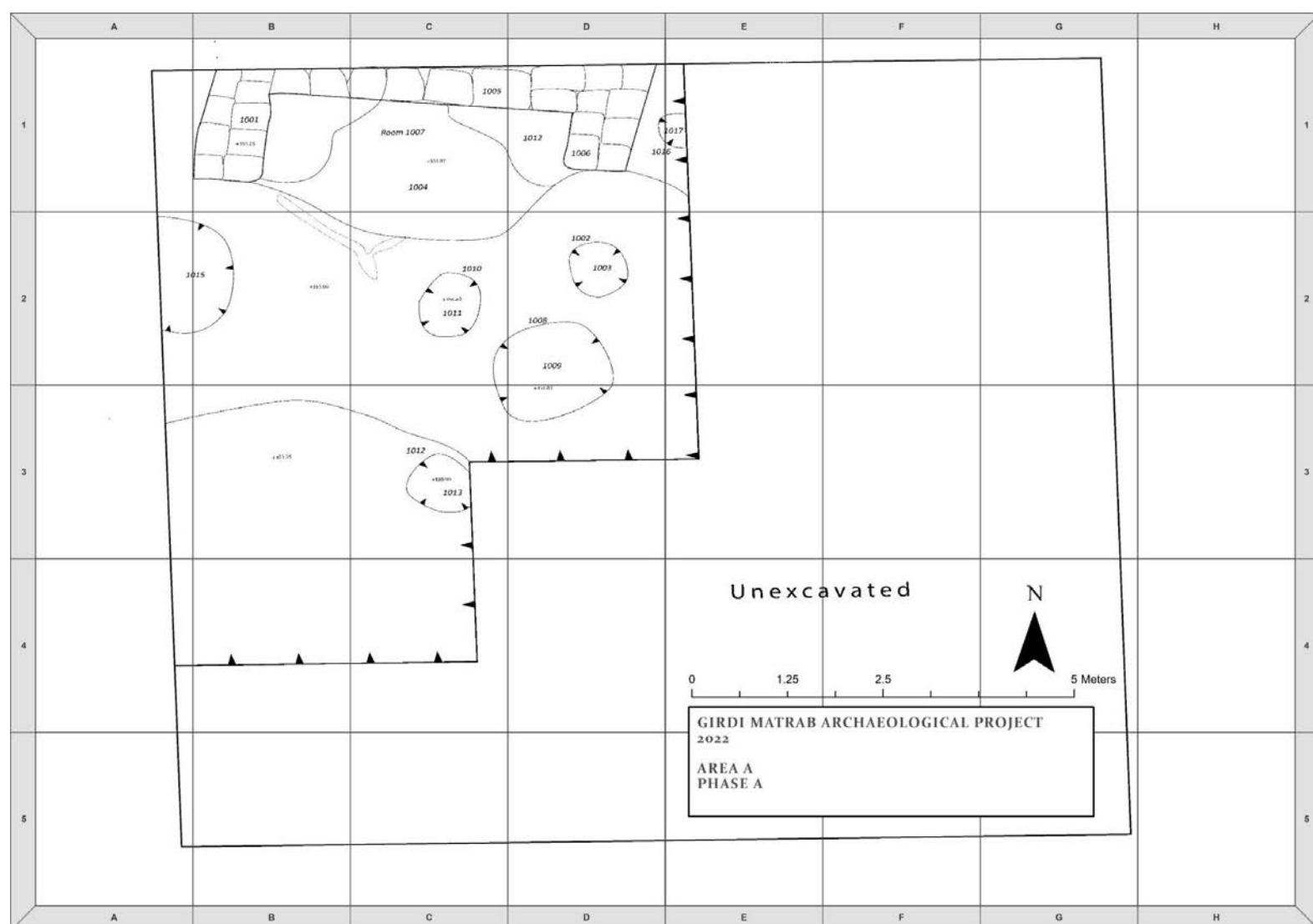


Fig.4. Plan of structures and features of Phase A.

Ceramic data from Phase A indicates a possible chronology of late 3rd - early 2nd c. BC. The assemblage bears traces of both pre-Hellenistic types (so-called post-Assyrian shapes, heavily influenced by the Neo-Assyrian pottery) and locally produced and widespread vessels, like i.e., the Rolled Over Rim Jars. The relatively abundant presence of Fine Band Rim jars, initially thought to be chronologically attributable to the late Hellenistic and Parthian period, could be a good indicator of the use of such ceramics in an earlier phase than commonly known.



Fig. 5. Pottery assemblage from the unit 1004 belonging to the Phase A of Girdi Matrab.

The occupation highlighted in Phase A is difficult to interpret because of the scanty architectural evidence and the heavily disturbed context. No significant sign of destruction was detected during the excavation and it is plausible that the area was simply re-configured very few years later, as confirmed by Phase B, which will be discussed next on in this report.

During the demolition of 1004 and the exposure of 1017, GMAP team started to identify the top of several mudbrick walls at ca 45 cm below the topsoil (+ 351.20 ca). These architectural features - together with others that will be discussed below - represent the first evidence of the so-called Building A, part of the geophysically-identified large complex and belonging to the Phase B of Matrab.

The first wall to be identified was 1019 a long (3.90 m) NW-SE aligned wall that cut the excavation area in half, also separating two different soil texture: whitish and hard soil in the North and reddish, hard, compacted deposits in the South (i.e., 1017). North of 1019, and connected to it, two other mudbrick walls were identified. Wall 1026 (2.36 x 0.75 m) runs from SW to NE and forms the eastern wall of Room 1070, and the western limit of the Storage Room 1071, as I will be discussing later on. The eastern wall of this possible storage room, and also in phase with 1019 is the Wall 1024 (2.27 x 0.60 cm), which also represents the western wall of Room 1072, located in the eastern part of the excavation trench. 1019 is connected to the South to the NE-SW aligned wall 1020, which conversely links to the NW-SE aligned wall 1043. These three mudbrick walls form the limit of Room 1073, located to the South/South-West of the other three rooms of the building (1070, 1071, and 1072).

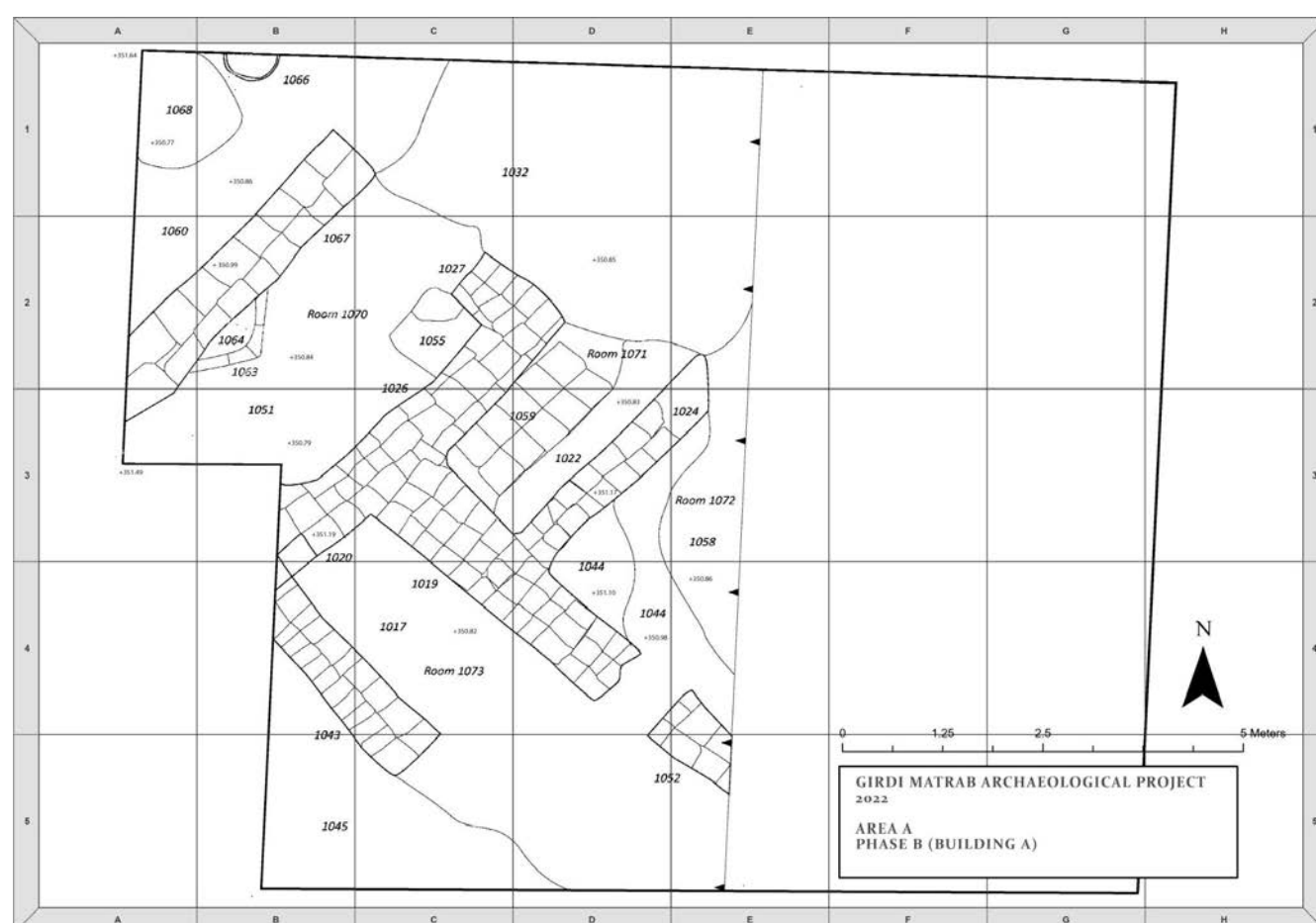


Fig. 6. Final Plan of the architectural features of Building A at the end of the season. Stratigraphic units and elevation points are marked in the plan.

Floors have been identified in three of the rooms (1070, 1071, and 1072), whereas in 1073, the floor has been either not preserved at all or fully eroded by the deposit of 1017 on top of it. In 1072, the floor (1058) was discovered after the excavation of a large, ashy, and grey deposit (1044), which accumulated over a simple, beaten earth floor with a limited number of pottery sherds and animal bones. In 1071 the floor was preserved in much better condition (1059). It was composed of a series of large (40 x 40 cm) mudbricks, only partially destroyed by the later fill (1022), which impacted the floor solely in the southeastern part of the room. As in the case of 1072, only a very limited number of pottery was dug up in the room and on its floor.



Fig. 7. The hard, compacted, mudbricks floor in Room 1071, with the fill 1022 to its right.

Both to the South and to the North of the building we were unable to identify further architectural remains. While the southern part of the excavation trench is heavily disturbed by its close proximity to the topsoil and might yield more data in the future campaigns, it is tempting to suggest that the area North of 1070, 1071, and 1072, characterized by a white, compacted (beaten earth) soil, was an open-air zone of the complex, possibly devoted to cooking operations. This last evidence finds confirmation in the presence of a very well preserved *tannur* (oven) in the northwestern sector of the courtyard.

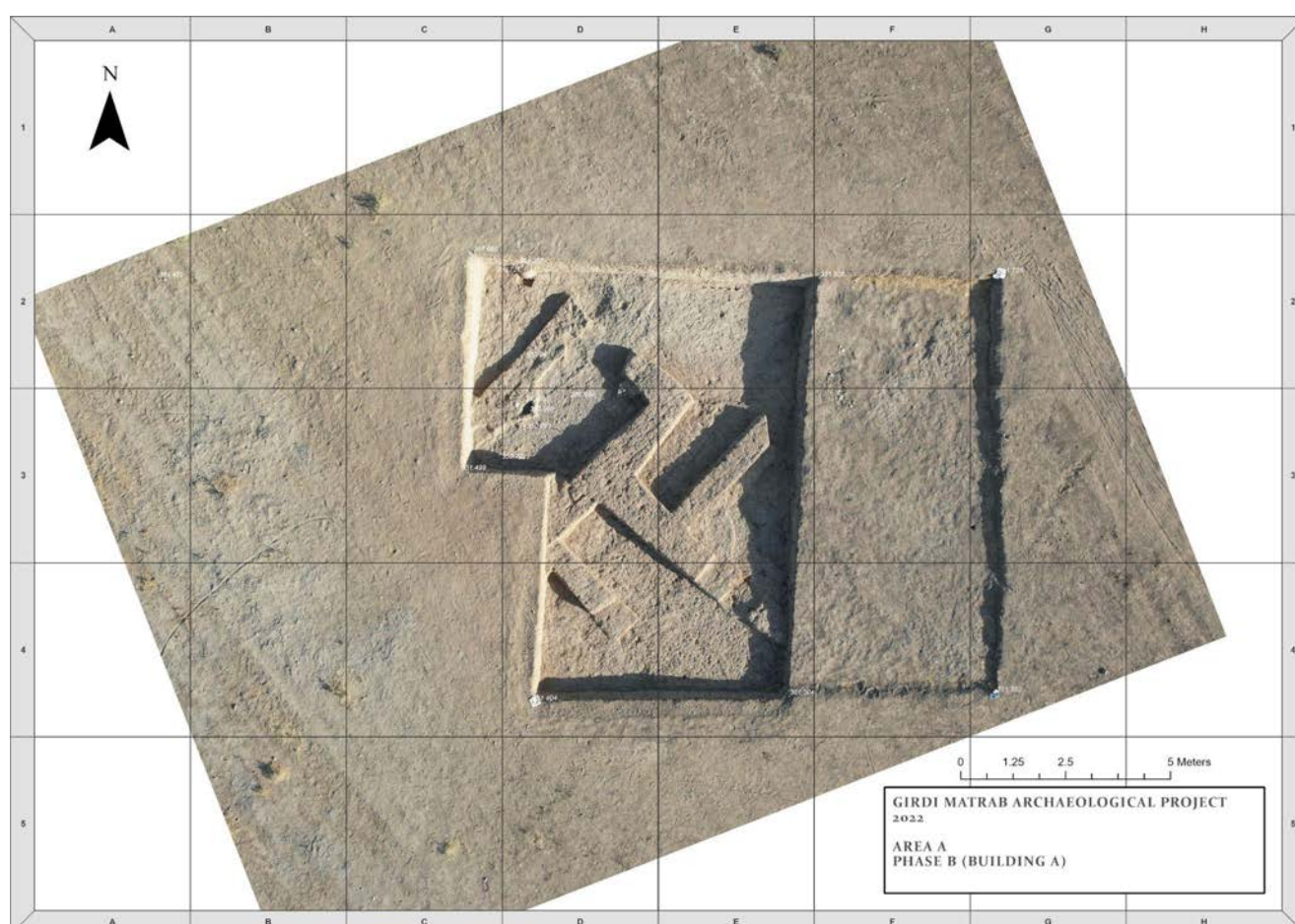


Fig. 8. Orthomosaic of the remains of Building A at the end of the season. Floor 1051 was still in situ at the time of the photo.

Unlike the floor already described, Room 1070 featured a more complex and well preserved floor (1051), consisting of a large area (4.06 x 2.18 m) between walls 1026 and wall 1067 to the NW. Floor 1051 was composed by a mix of different artifacts and materials embedded in the grey, compacted beaten earth, which included pottery sherds (largely mid-sized bodysherds), pebbles of small to medium dimension and animal bones. Room 1070 also featured two different installations, respectively located at the northeastern corner, and adjacent to the wall 1027, and along the wall 1067. The former (1055) might be possibly interpreted as a mudbrick working platform, perhaps used as a counter-like space in the room. The second one (1064) lies right next to the eastern facade of wall 1067 and it consists of a sub-circular small fireplace made out of vertically placed $\frac{1}{2}$ mudbricks. Considering the presence of the *tannur* 1066 just outside the room, it is possible that this small fireplace served as a heating feature for this part of the building rather than for food preparation and processing.

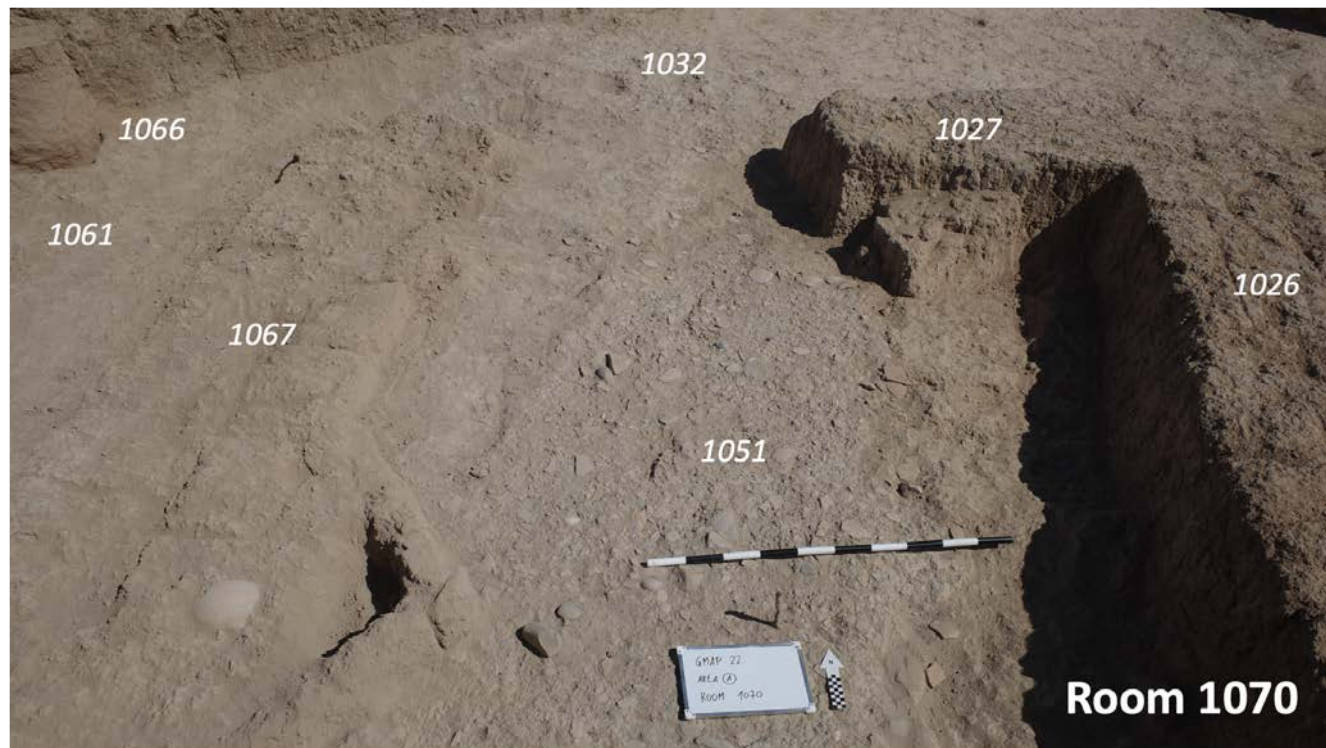


Fig. 8. View of Room 1070 and its associated floor (1051) from the South-West. *Tannur* 1066 is also visible at the exterior of the Room.

Throughout the whole building there were no signs of destruction or of a violent ending of the architectural features. The height of the walls, and the relatively scarce amount of ceramics unearthed, might actually suggest that the building was rather vacated and abandoned. From a functional point of view, it is plausible that Building A was part of a larger farmstead or agricultural complex. Some objects, found in close proximity of Floor 1051 also indicate a household-level context. Spindle whorls, metal objects, grinding stones, among others, strongly suggest a domestic environment.



Fig. 9. Some of the objects excavated in stratigraphic relationship with Room 1070 and Floor 1051.

4. Pottery Data

This year the GMAP team excavated a total number of 5182 pottery sherds, of which 604 diagnostic types. The majority of the assemblage (73.5 %) belongs to commonware, and mostly closed vessels (i.e. jars, jugs, and various pots). In terms of chronology, the repertoire of both Phase A and Phase B falls within the early years of the Seleucid period in Mesopotamia (ca. late 4th c. BC - early 3rd c. BC). A balanced mix of Assyrian- tradition ceramics - thickened rim bowls and a necked-jar like types - and types from Hellenistic North Mesopotamia - incurved rim bowls, flat-top rim bowls, and rolled-over rim jars - constitute the almost totality of the analyzed pottery.

All the excavated ceramics, from the topsoil to the floor 1051, have been drawn and scanned. Circa 40 % of the ceramics have been also processed into our dedicated FileMaker Pro database.

Gird-i Matrab Archaeological Project

ID No.	GM.22.S.107
Area	A
Stratigraphic Unit	SW
Context	
Locus	
Outer Surface	Self-slipped
Inner Surface	Self-slipped
Decoration Type	
Decoration Description	Decorazione a cordonatura e incisioni a
Technique	Wheel-thrown
Firing	2
Inner Color	10YR 8/4 very pale brown
Outer Color	10YR 8/4 very pale brown
Fabric Color	10YR 8/4 very pale brown
Temper Type	Grit
Temper Size	a1
Temper Density	1
Description	
Chronology	
Excavation Phase	
Observation	
Ware	Storage
Shape	
Rim Type	
Neck Type	
Body Type	
Base Type	
Handle Type	
Rim Diameter	
Rim Thickness	
Base Diameter	
Base Thickness	
Wall Thickness	1,6
Photo	<input checked="" type="checkbox"/> Yes
Drawing	<input checked="" type="checkbox"/> Yes
Crate	2
WT Type	

Fig. 9. Record Sheet of GMAP dedicated FileMaker Pro Pottery Database with example of a processed sherd.

In terms of stratigraphic reliability, the pottery excavated on the Floor 1051 is particularly important. Of the 621 sherds excavated from the floor, 521 of them belong to Commonware, that is exactly 90 % of the total assemblage. As the sherds were embedded in a frequentation floor it is obvious that the majority of them are plain bodysherds. Indeed, only 43 diagnostics have been collected. Among which, we also collected Ubaid and Late Chalcolithic period sherds, which, being available at the site, were used as, *de facto*, pebbles.

Among the Hellenistic period types embedded in the floor, it is important to note that they belong to both closed and open vessels, the former being in major quantity. Interestingly, both Rolled-over rim jars and Flat top rim bowls have been collected, indicating perhaps - or, rather, confirming - that the Floor 1051 of the Room 1070 and hence of the Building A, has to be dated to a period between the very final years of the 4th c. BC.

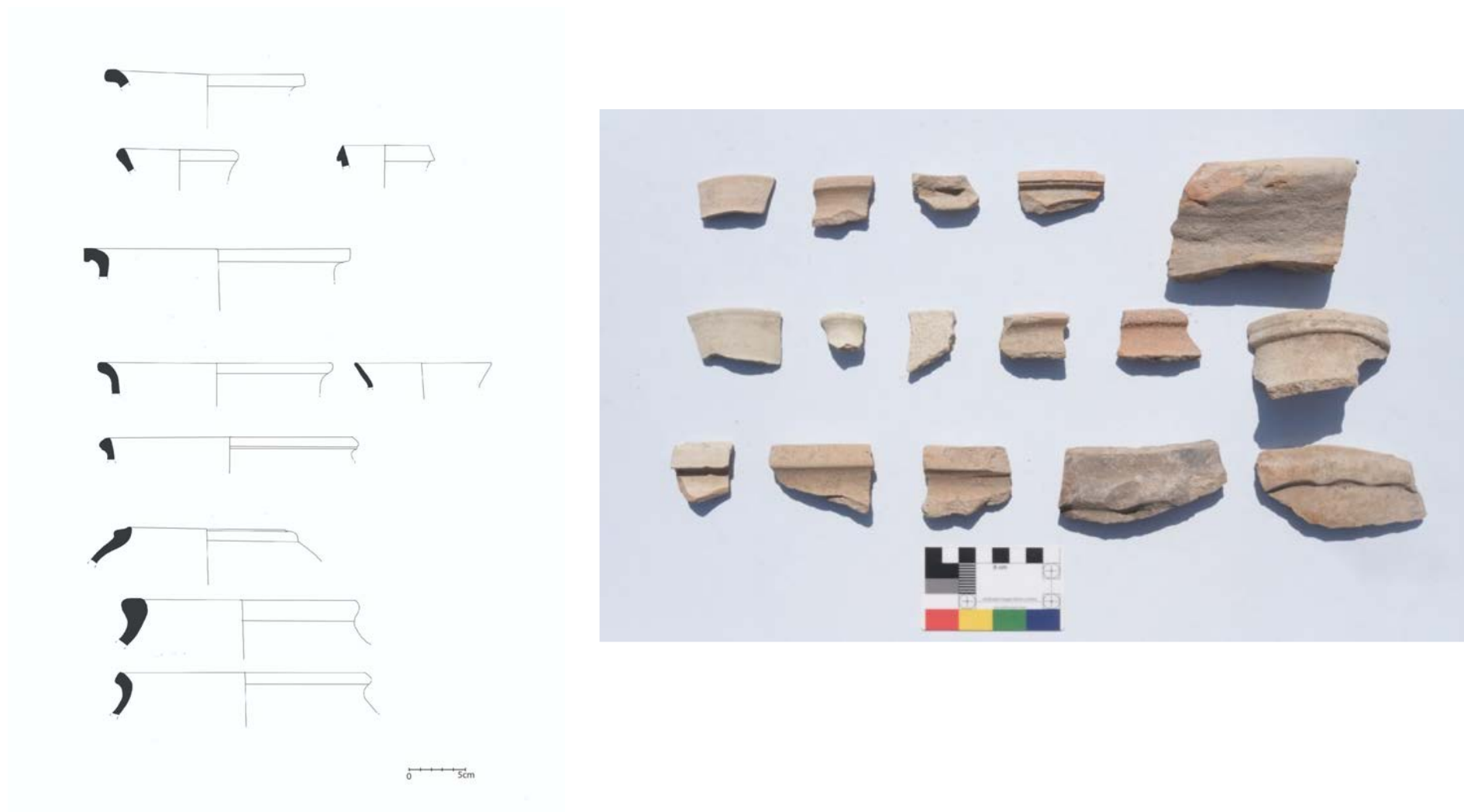


Fig. 9. Selection of Hellenistic period ceramics from the fill above Floor 1051. Drawings and Photo.

5. Faunal Remains Analysis

Dr Nathalie Brusgaard (University of Groningen, The Netherlands)

Faunal remains were recovered during the excavation through hand collecting and sieving. A total of 1464 faunal remains (Number of Identified Specimens; NISP) were recovered and studied, weighing a total of 4890 g (Table 1). They were recovered across 31 stratigraphical units.

UNIT	BAG NR	NISP	NUMBER OF FRAGMENTS	WEIGHT (G)
1001	0	3	4	15
1004	0	102	119	556
1005	0	65	65	42
1013	0	2	2	8
1015	0	30	33	86
1017	0	9	9	39
1018	0	1	1	6
1022	0	10	10	13
1025	0	2	2	30
1029	0	15	15	28
1031	0	23	32	276
1032	0	21	21	147
1034	0	3	3	9

1035	0	4	4	4
1036	0	26	26	91
1037	1	18	19	75
1037	2	102	133	559
1041	0	3	5	8
1042	0	21	23	123
1044	0	22	22	59
1045	0	2	3	5
1046	0	2	2	20
1049	0	70	72	226
1050	0	15	15	28
1051*	0	57	58	166
1056	0	18	20	82
1058	0	21	21	38
1060	1	52	53	155
1060	2	135	135	305
1061	0	83	104	512
1062	0	102	107	261
1065	0	387	393	637
∅	0	35	49	269
∅	2	3	3	12
TOTAL		1464	1583	4890

Table 1 Number of Identified Specimens (NISP) and weight per stratigraphic unit.

- The analysis of the faunal remains from 1051 was only partially completed due to time constraints.



Fig 11. Selection of bones from unit 1004 of Phase A.

The majority of specimens are domestic animals. The most common identified species is sheep/goat (*Ovis aries/Capra hircus*) (NISP = 59), followed closely by pig (*Sus scrofa domesticus*) (NISP = 47), and cattle (*Bos taurus*) (NISP = 31) (Table 2). It is not possible to distinguish between sheep and goat based on morphology. Other identified species are equid (*Equus* sp.) (NISP = 6), which could be domestic horse, donkey, or onager, and gazelle (*Gazella* sp.), which could be Goitered gazelle or Mountain gazelle. It is not possible to identify which equid or gazelle they represent based on morphology. A large number of specimens could not be identified to genus or species level.

SPECIES	TAXONOMIC NAME	NISP	PERCENTAGE NISP	WEIGHT (G)	PERCENTAGE WEIGHT
Cattle	<i>Bos taurus</i>	31	2,12%	876	17,9%
Sheep/goat	<i>Ovis aries / Capra hircus</i>	59	4,03%	562	11,5%
Pig	<i>Sus scrofa domesticus</i>	47	3,21%	380	7,8%
Equid	<i>Equus</i> sp.	4	0,27%	51	1,0%
Gazelle	<i>Gazella</i> sp.	6	0,41%	52	1,1%
Sheep/goat/gazelle		15	1,02%	63	1,3%
Ungulate		125	8,54%	553	11,3%
Large mammal		26	1,78%	404	8,3%
Small mammal		13	0,89%	13	0,3%
Mammal unidentifiable		1138	77,73%	1936	39,6%
TOTAL		1464	100,00%	4890	100,0%

Table 2 Frequency of identified species.

For sheep/goat, pig, and cattle, cranial and postcranial elements were recovered, indicating that these animals were kept and slaughtered on site. Of the sheep/goat specimens that could be aged, the majority were between 1 and 6 years old. A few lambs are also present in the assemblage. Of the pigs, the majority were between 2 and 14 months old, indicating they were slaughtered at a young age. Of the cattle, the majority were adults, older than 24 months.

164 specimens were burned or charred, of which 137 specimens were recovered from unit 1060. Four specimens have cut marks and one cattle bone has a pathology.

6. Auger Testing Report

Mr. Jordan Brown (Berkeley University, USA)

6.1 Introduction

On September 4th and 5th, 2022, Jordan Brown (UC Berkeley), Giuseppe Salvatore Michele La Porta, Lara Pucci Daniele, Parsa Keirandish (University of Pisa), and Jack Bishop (Harvard University) carried out auger sampling and borehole photogrammetry of the central mound at Girdi Matrab and underlying sediments. This report will describe the methods used, preliminary results, and future plans for analysis of data collected.

6.2 Methodology

Two auger tests were sited in the central mound of Girdi Matrab, in order to develop techniques for rapid study of mounded sites and to get a first-order answer to the question of whether the hiatus in Girdi Matrab's settlement indicated by surface collection of ceramics is borne out by the subsurface evidence. Surface vegetation and loose sediment was cleared from two small areas (~1 ft diameter) on the upper southern flank (GM-01) and near the top of the mound (GM-02), approximately 10 m north of GM-01.

Sediment was then recovered from the subsurface using a 4-inch diameter bucket auger. At GM-01, each auger bucketful of sediment was emptied into a fine sieve, photographed, and briefly described. The depth of the auger borehole at that point was then measured, indicating the maximum depth from which sediment in that auger sample was taken. The sampled sediment was then collected in a backdirt pile, and the next auger bucket collected. At GM-02 sediment was collected in a series of three bucketfuls, poured sequentially onto a tarp so as to be arranged stratigraphically before photographing and depth measurement. In both cases, a sample number corresponds to a single photograph. All backdirt was reburied in the empty auger holes when the tests were completed and the surface was tamped down and smoothed for safety and conservation reasons.

GM-01 was carried down to a depth of 450 cm and GM-02 to a depth of 122 cm; the latter was halted by a large stone obstructing the borehole path. One or another type of sample was collected from most auger buckets, e.g., ceramics, lithics, or mudbrick; bulk sediment for various geoarchaeological and chronometric analyses; separate opportunistic carbon samples for dating and other selected geoarchaeological samples for sediment analysis (e.g., of carbonate nodules for isotopic analysis). GM-01 appears to have reached the paleo surface on which the mound was developed, so presents the opportunity for analysis of ancient soil landscapes. The interior of both boreholes was imaged by endoscope and photogrammetric models of these stratigraphic sections are now being developed.

6.3 Results

A full analysis awaits the detailed tabulation and comparison of fieldnotes, photographs, and samples, but a basic description of the structure of GM-01 and comparison with that of GM-02 will be presented here. From 0-86 centimeters below surface (cmbs), GM-01 was characterized by relatively incohesive, light gray brown sediments, with numerous potsherds and mudbrick fragments, as well as some animal bones and teeth. From 86-104 cmbs, the sediment was dark brown and cohesive, with no artifacts or mudbrick. From 104-220 cmbs, sediment was of middling (and variable) color and cohesion, with no artifacts but occasional mudbrick fragments and a number of pebbles, along with a couple of larger stones at various depths. From 220-272 cmbs, sediment was light brown and—except for possibly recent (overnight?) bioturbation—very cohesive, and included pebbles and mudbrick and bone fragments. From 272-380 cmbs, sediment color and cohesion was again variable (often a yellow brown sandy clay), but characterized by numerous potsherds, (worked?) stone, bone, and mudbrick fragments, shells, and one piece of worked obsidian (recovered from between 272 and 283 cmbs). From 380-411 cmbs, sediment was light brown, carbonate-rich, and contained larger soil peds, with no artifacts. From 411-420 cmbs, sediment varied but contained pottery. From 420-450 cmbs, sediment was very compact, highly organic, and contained no artifacts but small clay fragments, apparently subjected to heat but friable and not with any clear form or fabric. We suggest that these last 30 cm of depth may represent part of a preoccupation soil landscape and present the possibility for analysis of pre-settlement land cover and land use.

The alternating stretches of artifact-rich versus artifact-poor (but sometimes stone- and mudbrick-rich) sediments described above suggest that GM-01 was located at coordinates where activities varied significantly through time, leaving behind (portable) artifactual versus constructional materials, and being subject probably to differing rates of deposition and thereby different soil-formation processes (hence differences in chemical and physical properties reflected in color—variations in carbonate content were also noted—and cohesion). The lack of artifacts between 86 cmbs and 272 cmbs is frustrating with regard to validating the observed chronological hiatus in surface artifacts on the site.

However, it is interesting to note the four broad alternating sectors of artifact density by volume: 0-86 cmbs (high), 86-272 cmbs (low), 272-380 cmbs (high), and 380-450 cmbs (low). Further study is needed to assess whether these changes in density correspond to changes in sedimentation rate and thus use of different spaces on the mound differently. GM-02 underscores this question by presenting a somewhat different picture: varying sediment properties, but consistent artifact presence (along with constructional material) throughout the entire 122 cm sampled before obstruction.

6.4 Ongoing Work

We hope that analysis of geochemical, chronometric, and artifactual samples collected will provide the opportunity to trace other variables with depth that might clarify the differing histories of activity in these two locations on the mound, and give a sense to what extent the history of such a mound may be illuminated by auger-based survey. We hope also that the endoscopic photogrammetry of the auger boreholes themselves will allow all of these recovered data to be placed in a firm archaeological stratigraphic framework, taking account of evidence of structures (e.g., intact mudbricks visible in raw endoscope images) which appeared only indirectly (e.g., as splashes of reddish coloring) in recovered sediments.

7. Conclusions and Future Works



Fig. 12. A drone view of the excavation area at the end of the 2022 campaign (Tell Baqrta is very well visible in the background and in close proximity of Girdi Matrab)

The first season of the GMAP went unexpectedly well in terms of data collection. We ground-truthed the subsurface evidence highlighted in 2021 and we managed to expose the easternmost sector of the Building A. Despite being so close to the topsoil, the architectural features, as well as the mudbricks, are surprisingly well preserved. After the exposure of Phase B, some preliminary considerations can be made around the architectural layout and the function of the walls and rooms unearthed. It is quite clear that we are in the presence of a large domestic complex, with multiple rooms. The excavated pottery, as well as the spatial organization of the rooms uncovered in this season, suggest that this eastern part of the Building A complex was perhaps dedicated to the storage (Room 1071), and to practices of food processing (Room 1070; Court 1032; Tannur 1066). In 2023 the GMAP team plans to extend the current trench to the West in order to explore the part of the building towards the big central courtyard visible in the magnetometry data.



Fig.13.. 3D Tiled Model of the excavation area at the end of the season obtained through AgiSoft Metashape

In addition to the investigation of the western half of Building A in Area A (Mound 2), in 2023 GMAP team will also attempt to open two more excavation areas. Area C will be opened as a step-trench on the main mound of the site (Mound 1), whereas Area B will be hopefully excavated as a sounding to ground truthing a potential multi-room building - with the same alignment of Building A - which seems to be visible in the CORONA satellite imagery (Mission 1039, February 1967).

Also, and in accordance with a team from Emory University, led by Dr. Petra Creamer, the GMAP intends to perform additional subsurface evidence, perhaps in the spring of 2023. These will be localized in the area between Mound 1, 2, and 3, on the lower part of Mound 4 (where a great abundance of Late Chalcolithic period sherds was detected by the 2020 intensive survey), and in proximity of Mound 6.

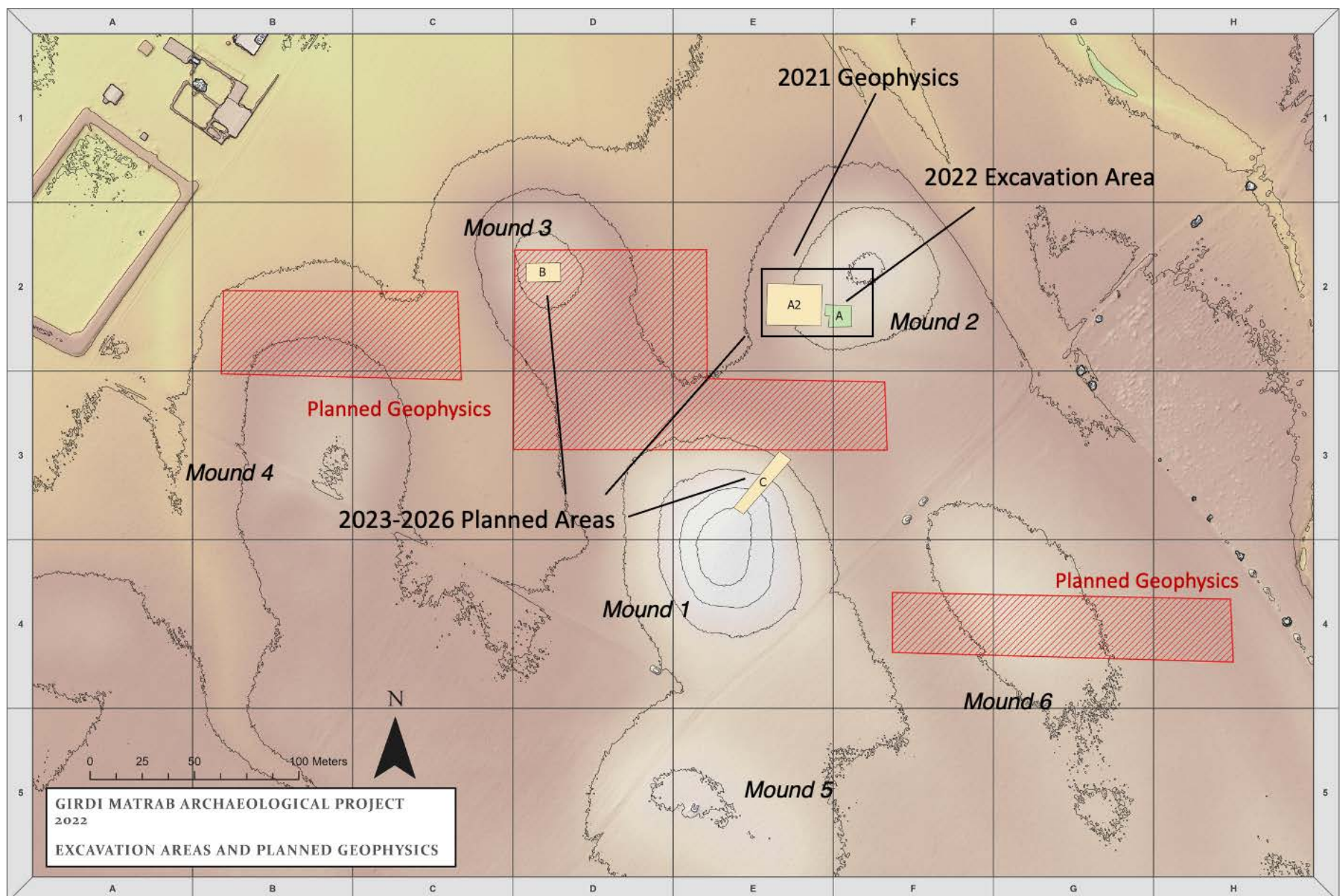


Fig. 14. Map of the site with prospective investigation areas and planned blocks for geophysical exploration.

8. Acknowledgments

First and foremost we wish to thank Dr. Kayfi Mustafa Ali and Dr. Nader Babakr for their constant interest and support in the project. The GMAP team wish to express their gratitude to many people who made possible the initial season of the project. A heartfelt thanks goes to our main financial supporters: Gerda Henkel Stiftung, American School for Overseas Research (ASOR), University of Pisa, and the Italian Ministry of Foreign Affairs. During our stay in Erbil the Italian Consul, Dr. Michele Camerota, was of full support to the team. We all would like to thank our housemates from the Harvard team (Prof. Jason Ur, Prof. Tim Matney, Dr. Mehrnoush Soroush, Dr. Elise Laugier, Ms. Nisha Kumar, Ms. Madeleine Ouimet, Mr. Jack Bishop, Mr. Jordan Brown) and the Emory University team (Prof. Petra Creamer, Dr. Kyra Kaercher, Ms. Glynn Maynard): it was a great experience sharing working hours and spare time with such an enthusiastic group of people. A special thanks goes - as in previous years - to Mr. Bapir Bawil Agha, our unique fixer and incredibly good friend. A very warm thank you to Hassan Mohammed, our great cook: feeding one archaeological project is a challenge, feeding three - and succeeding - is a miracle. GMAP team got to the site daily thanks to our reliable driver Mohammed (nickname: Sangennaro): a good asset for the team and occasionally master of shovel.

Our final thanks go to our workmen: without them this project and this report would not exist.

Appendix

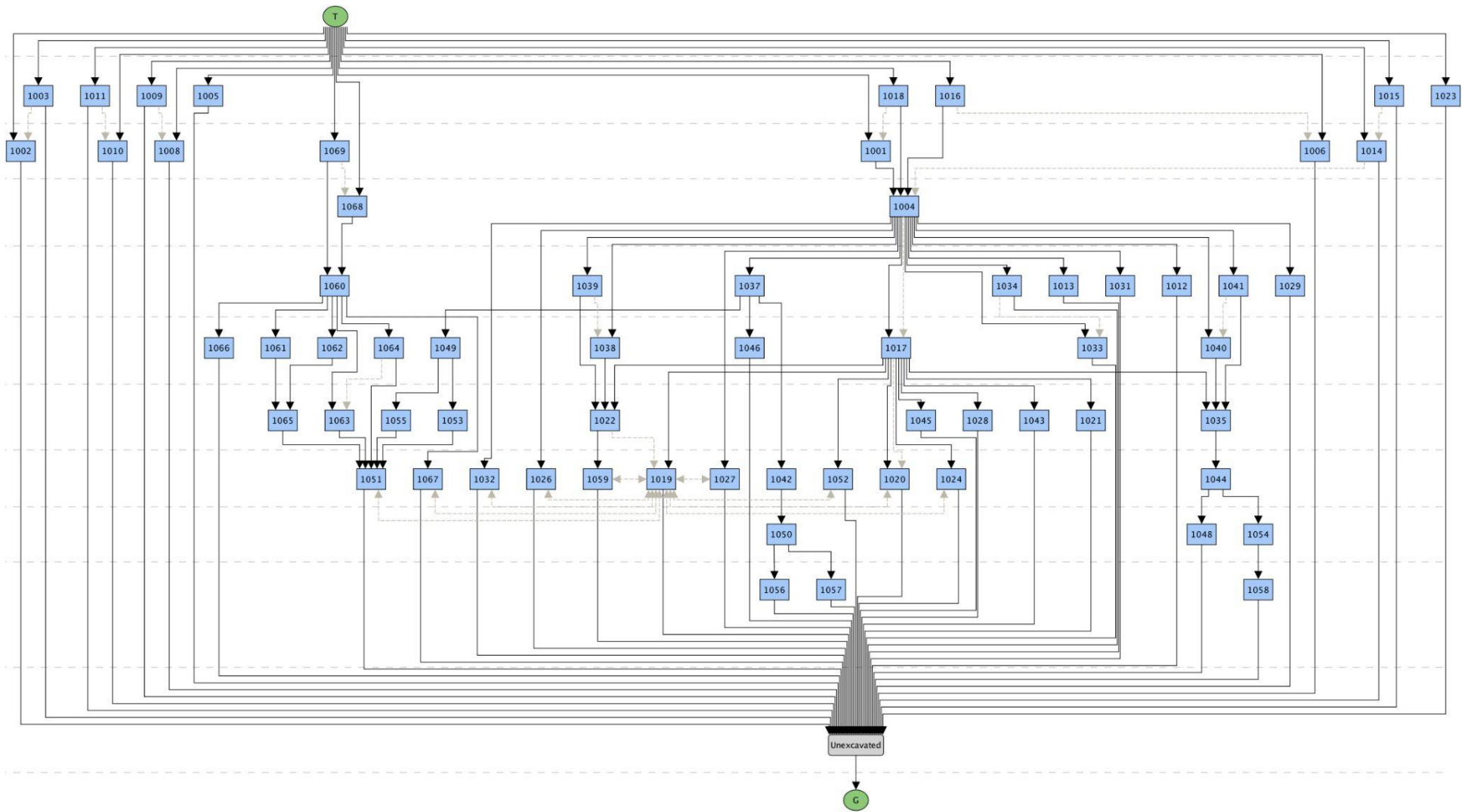


Fig. 15 The Harris Matrix of GMAP 2022 built with the aid of the Harris Matrix Composer app (HMC).

List of Excavated Stratigraphic Units

Unit Number	Phase	Description	Date
0	A	Surface	25 Aug
1001	A	Mudbrick Wall	28 Aug
1002	A	Pit	29 Aug
1003	A	Fill	29 Aug
1004	A	Grey Soil Deposit	29 Aug
1005	A	Mudbrick Wall	29 Aug
1006	A	Mudbrick Wall	29 Aug
1007	A	Room	29 Aug
1008	A	Pit	29 Aug
1009	A	Fill	29 Aug
1010	A	Pit	29 Aug
1011	A	Fill	29 Aug
1012	A	Collapsed Mudbricks	29 Aug
1013	A	Collapsed Mudbricks	29 Aug
1014	A	Pit	30 Aug
1015	A	Fill	30 Aug
1016	A	Collapsed Mudbricks	30 Aug
1017	B	Reddish Deposit	31 Aug
1019	B	Mudbrick Wall	1 Sept

1020	B	Mudbrick Wall	1 Sept
1021	B	Collapsed Mudbricks	1 Sept
1022	B	Fill	3 Sept
1023	B	Mudbrick Wall	3 Sept
1024	B	Mudbrick Wall	3 Sept
1025	A	Soil Deposit	3 Sept
1026	B	Mudbrick Wall	3 Sept
1027	B	Mudbrick Wall	3 Sept
1028	B	Fill	3 Sept
1029	B	Fill	4 Sept
1030	B	Grey Soil Deposit	4 Sept
1031	B	Brown Soil Deposit	4 Sept
1032	B	White-Grey Soil Deposit	4 Sept
1033	A	Pit	5 Sept
1034	A	Fill	5 Sept
1035	B	Soil Deposit	5 Sept
1036	<i>voided</i>	<i>voided</i>	<i>n/a</i>
1037	B	Whitish Soil Deposit	5 Sept
1038	B	Pit	6 Sept
1039	B	Fill	6 Sept
1040	B	Pit	6 sept
1041	B	Fill	6 Sept
1042	B	Collapsed Mudbricks	6 Sept
1043	B	Mudbrick Wall	10 Sept
1044	B	Whitish Soil Deposit with Ash Patches	10 Sept
1045	B	Brown Fill	13 Sept
1046	B	Mudbrick Wall	13 Sept
1047	<i>voided</i>	<i>voided</i>	<i>n/a</i>
1048	B	Reddish Fill	18 Sept
1049	B	Grey/Black Soil Deposit	14 Sept
1050	B	Whitish Soil Deposit	14 Sept
1051	B	Floor	14 Sept
1052	B	Mudbrick Wall	14 Sept
1053	B	Fireplace	15 Sept
1054	B	Collapsed Mudbricks	15 Sept
1055	B	Mudbric Platform	15 Sept
1056	B	Grey Soil Deposit	18 Sept
1057	B	Grey/Brown Fill	18 Sept
1058	B	Grey Soild Deposit with Ash Patches (Floor?)	18 Sept
1059	B	Mudbrick Floor	21 Spet
1060	B	Reddish Surface Layee	25 Sept
1061	B	Grey Soil Deposit	26 Sept
1062	B	Dark Grey Soil Deposit with Pebbles and Sherds	27 Sept
1063	B	Sub-circular Mudbrick Fireplace	27 Sept
1064	B	Fill	27 Sept
1065	B	Grey Soild Deposit with Ash Patches	27 Sept
1066	B	Tannur	27 Sept
1067	B	Mudbrick Wall	27 Sept
1068	B	Pit	28 Sept
1069	B	Fill	28 Sept
1070	B	Room	29 Sept

1071	B	Room	29 Sept
1072	B	Room	29 Sept
1073	B	Room	29 Sept

Bone and Charcoal Samples

Dr. Nathalie Brusgaard (University of Groningen) and Dr. Rocco Palermo (University of Pisa)

A discrete amount of bone samples, along with selected charcolars, was collected in order to be analyzed in dedicated labs. Primary analyses will include Radiocarbon dating (C14), bone-collagen and stable isotope analysis. All these will be executed by the Tandemlaboratoriet at the University of Uppsala (Sweden).

Samples were numbered and listed by ID to keep track of each specimen during the custom controls at both Erbil and Istanbul Airport.

Export Number	Sample	Type	Stratigraphic Unit	Date Collected
1	1062.0.18	Bone	1062	28-Sep
2	1037.3.25	Bone	1037	28-Sep
3	1037.2.6	Bone	1037	28-Sep
4	1062.0.13	Bone	1062	28-Sep
5	1065.0.2	Bone	1065	28-Sep
6	1065.0.1	Bone	1065	28-Sep
7	1037.1.1	Bone	1037	28-Sep
8	1046.0.2	Bone	1046	28-Sep
9	1032.0.9	Bone	1039	28-Sep
10	1060.1.8	Bone	1060	28-Sep
11	1049.0.4	Bone	1049	28-Sep
12	1004.0.1	Bone	1004	28-Sep
13	1049.0.7	Bone	1049	28-Sep
14	1065.0.24	Bone	1065	28-Sep
15	1065.0.25	Bone	1065	28-Sep
16	1061.0.15	Bone	1061	28-Sep
17	1037.2.2	Bone	1037	28-Sep
18	1032.0.8	Bone	1032	28-Sep
19	1051.0.5	Bone	1051	28-Sep
20	1051.0.3	Bone	1051	28-Sep
21	1049.0.5	Bone	1049	28-Sep
22	1051.0.4	Bone	1051	28-Sep
23	1051.0.1	Bone	1051	28-Sep

24	1051.0.2	Bone	1052	28-Sep
25	1048.6	Charcoal	1048	28-Sep
26	1056.7	Charcoal	1056	28-Sep
27	1036.4	Charcoal	1036	28-Sep
28	1051.2	Charcoal	1051	28-Sep
29	1050.5	Charcoal	1050	28-Sep
30	1036.8	Charcoal	1036	28-Sep
31	1029.3	Charcoal	1029	28-Sep
32	1036.9	Charcoal	1036	28-Sep



Fig. 16. Bones samples with ID numbers marked in red.



Fig. 17.. Charcoal samples with ID numbers marked in red.