Attachment F.2: Underwater Archaeology Impact Assessment Report

Archaeological Impact Assessment Report,

Aughinish Alumina Ltd,

Aughinish,

Co. Limerick.

09/11/2023

Report prepared on behalf of: Malachy Walsh & Partners
Planning Consultants,
Rinn Point,
Tralee,
Co. Kerry.

Acting on behalf of: Aughinish Alumina,
Aughinish,
Co. Limerick

Report written and researched by Laurence Dunne MIAI

MWP

laurence dunne
archaeology ltd

Contact Details:
3 Lios na Lohart, Ballyvelly,
Tralee, Co. Kerry.
Tel.: 0667120706
E-mail: lar@ldarch.ie
Web Site: www.ldarch.ie

2023 IAI Member

Contents

1 Introduction 4
2 Scope of work 6
2.1 Desk based research. 6
3 Proposed dredging locations at Aughinish Alumina 6
4 Archaeological & historic background of the Shannon Estuary 12
4.1 Preamble 12
4.2 Prehistory 12
4.3 Medieval 13
4.4 Uí Fidgente 14
4.5 Arrival of the Vikings 14
4.6 Uí Briain of Dal gCais 15
4.7 Arrival of the Anglo-Normans 16
4.8 Ships in the Shannon Estuary 17
4.9 The terrestrial archaeology of Aughinish 18
4.10 Shipwrecks of the Shannon Estuary 19
4.11 Intertidal cultural context of Aughinish 20
5 Previous licensed archaeological monitoring 21
6 AIA Results 21
6.1 Field inspection 21
6.2 Documentary 21
7 Impacts 22
7.1 Likely Impact of the Proposed Development on the unknown underwater and foreshore archaeology 22
8 Mitigation Measures 22
9 Conclusions 22
10 References 23
10.1 Documentary 23
10.2 Cartographic 24
10.3 Photographic 24
11 Appendix 1 25

Copyright Notice: Please note that all original information contained within this report, including all original drawings, photographs, text and all other printed matter deemed to be the writer's, remains the property of the writer and Laurence Dunne Archaeology and so may not be reproduced or used in any form without the written consent of the writer or Laurence Dunne Archaeology.

List of Figures

Figure 1: Site location map. 4
Figure 2: Location chart of the 2016 dredging operations. 5
Figure 3: Proposed dredging location areas (courtesy MWP). 7
Figure 4: Proposed suction dredged material dumpsite location in orange in Shannon Estuary (courtesy MWP). 7
Figure 5: Proposed Shannon Estuary dumping site currently used by the SFPC, (courtesy MWP). 8
Figure 6: Proposed dredging vessels (courtesy MWP). 8
Figure 7: Extract from 1st edition OS map of 1840 showing Aughinish Point. Note weir extending from east shore (encircled). 21

List of Plates

Plate 1: View from south of large jetty extending into the Shannon from Aughinish Point and proposed Area D (LDARCH 2023). 9
Plate 2: View of large jetty from its most eastern point. Note ships docked in proposed dredging areas A and C (LDARCH 2023). 9
Plate 3: View from east of service area 'Cells' containing proposed dredging Area B (LDARCH 2023). 10
Plate 4: View from west of service area 'Cells' containing proposed dredging Area B (LDARCH 2023). 11
Plate 5: View from south of service area with rock armour and mud flats to the south (LDARCH 2023). 11
Plate 6: View from south of beach and mudflats south of service area. Note jetty and service area in background (LDARCH 2023). 12
Plate 7: Shanid Castle, view from east. 13

1 Introduction

Aughinish Alumina Ltd operates a jetty which facilitates the delivery of raw materials for the alumina process and also for export of finished product. The jetty was constructed in the early 1980's (**Figure 1**).

In 2016 an 8-year Dumping at Sea (DAS) permit (Nr. S0026-01) and Foreshore Licence (Nr. FS006578) was granted to Aughinish Alumina Ltd to provide for ongoing maintenance dredging activity. The DAS permit and Foreshore Licence, that expires in 2024, allows for dredging by means of plough dredging at three defined locations (A-C) & **Figure 2**.

- Area A is the outer berth.
- Area B is what is called the 'Cells' which is the land-based area where the work boats / tender vessels operate from to transfer crew etc.
- Area C is known as the inner berth, and this is used for smaller ships for the delivery of process materials and the export of the final alumina product.

In that context, Laurence Dunne Archaeology submitted an archaeological report in 2016 as a component of the previous DAS permit application following which licensed archaeological monitoring of the plough dredging operations were undertaken (Dunne 2016a & 2016b). This current updated archaeological impact assessment (AIA) relates to a new DAS / Marine Usage Licence (MUL) application to allow for ongoing maintenance dredging at the jetty for a further period of 8 years and permission to dump dredged material at a permitted deposition area on behalf of Aughinish Alumina Ltd, Aughinish, Co. Limerick (**Figure 1**).

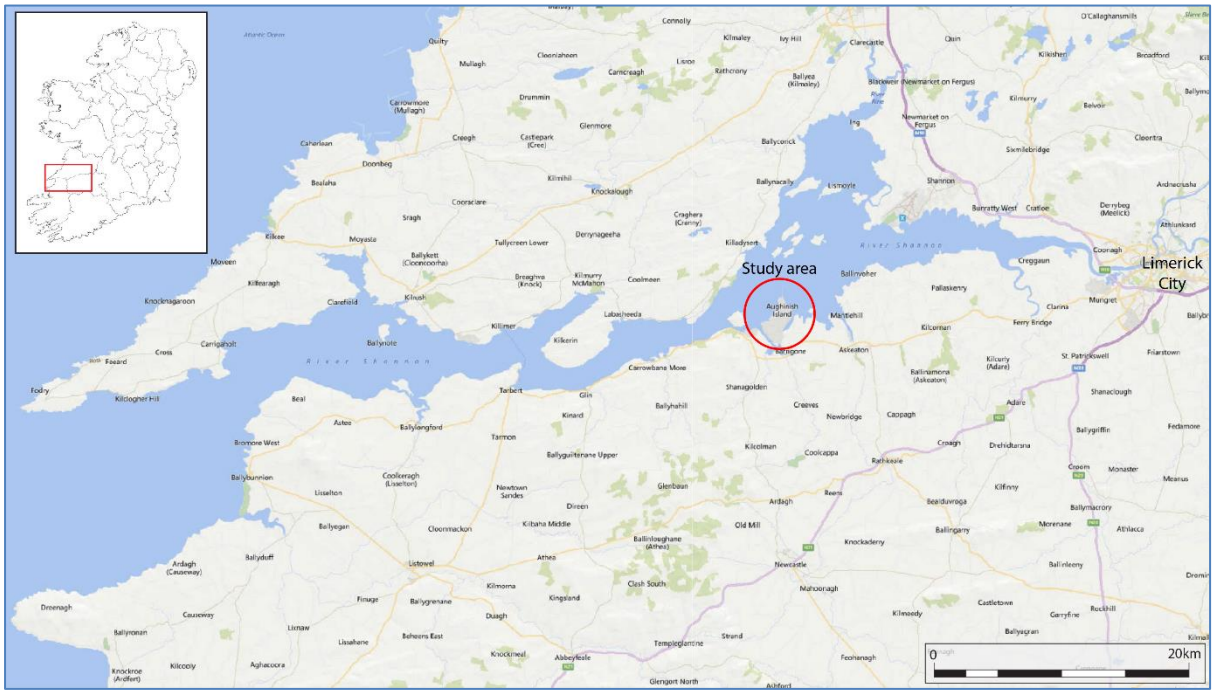


Figure 1: Site location map.

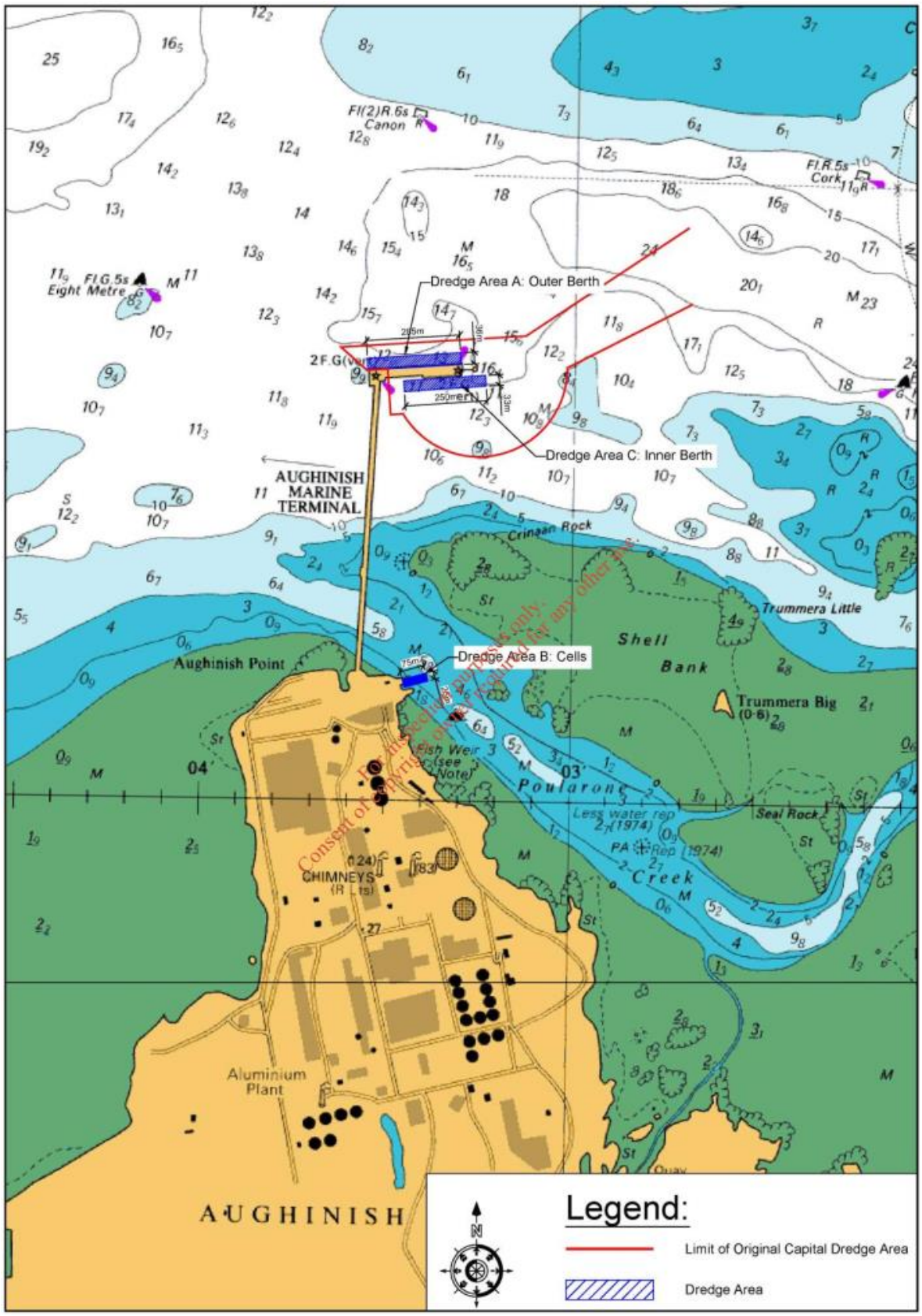


Figure 2: Location chart of the 2016 dredging operations.

2 Scope of work

2.1 Desk based research.

A combination of desk-based research and fieldwork was undertaken. A number of published and unpublished documentary, cartographic and aerial photographic sources were examined. In that context this report refers to a previous AIA by this author undertaken in 2016 and the results of subsequent licensed monitoring of dredging operations (Dunne 2016a & Dunne 2016b & see Section 9 below).

3 Proposed dredging locations at Aughinish Alumina

The jetty at Aughinish extends from Aughinish Point northwards into the Shannon for *c.*900m terminating at a long E-W deepwater berth that accommodates large ships for the importation of bauxite and the subsequent exportation of alumina (**Figure 2** & **Plates 1 & 2**). The current proposed dredging works comprise of four areas (Areas A – D, **Figure 3, Table 1 & Appendix 1**). Proposed dredging Area A extends in an E-W direction along the full 350m length of the northern side of the deepwater jetty and is the most used area of the deepwater jetty (350m x 65m). Area C comprises of the inner berth area parallel to Area A and extends for *c.*300m x 60m. Area D is an additional dredging area extending along the approach jetty to the deepwater berths for *c.*400m x 50. The 'Cells', Area B (c.75m x 35m), siltation here has impeded access from the service / tender vessels from the 'Cells' and along via the proposed Area D.

Table 1: Dredging area locations and dimensions

Dredging Area	Name	Location	Dimensions	Easting (ITM)	Northing (ITM)
A	Outer Berth	Jetty	525m x 120m	528414	655458
B	Cells	Service area	150m x 250m	528508	655391
C	Inner Berth	Jetty	400m x 120m	528415	654490
D	Approach jetty area	Approach jetty	450m x 150m	528415	654490

The topography of the seabed at the deepwater jetty is susceptible to the development of bumps and hollows due to bow-thruster action from the large ships berthing there - particularly on the most used outer or northernmost deepwater berth (Area A). The proposed Trailing Suction Hopper Dredger (TSHD) will remove the bumps and effectively reduce the seabed to design depth in Area A and deposit the dredged material in the designated dumpsite in the Shannon Estuary (**Figures 4 & 5**), within a SFPC area dumpsite off Foynes Island, (EPA Nr. S0009-03). Areas B, C & D will be subjected to plough dredging and also using a long reach track machine operating from a barge (LR/B) to level the seabed and reduce siltation (**Figure 6**). However, wider seabed levelling may be required outside of these areas to facilitate the navigation and manoeuvring of ships in their approach to the jetty. The wider area fundamentally reflects the limits of the previous dredging for the jetty all of which were previously archaeologically monitored (Dunne 2016b). Furthermore, the proposed maintenance dredging allows for a range of dredging technologies, wider periods for dredging and larger areas to accommodate dredging and dumping activities. A new dredge location adjacent to the jetty approach bridge (Area D) along with a new dedicated dumpsite in the estuary to receive material dredged by means of a TSHD, **Figures 4 – 6 & Appendix 1**).

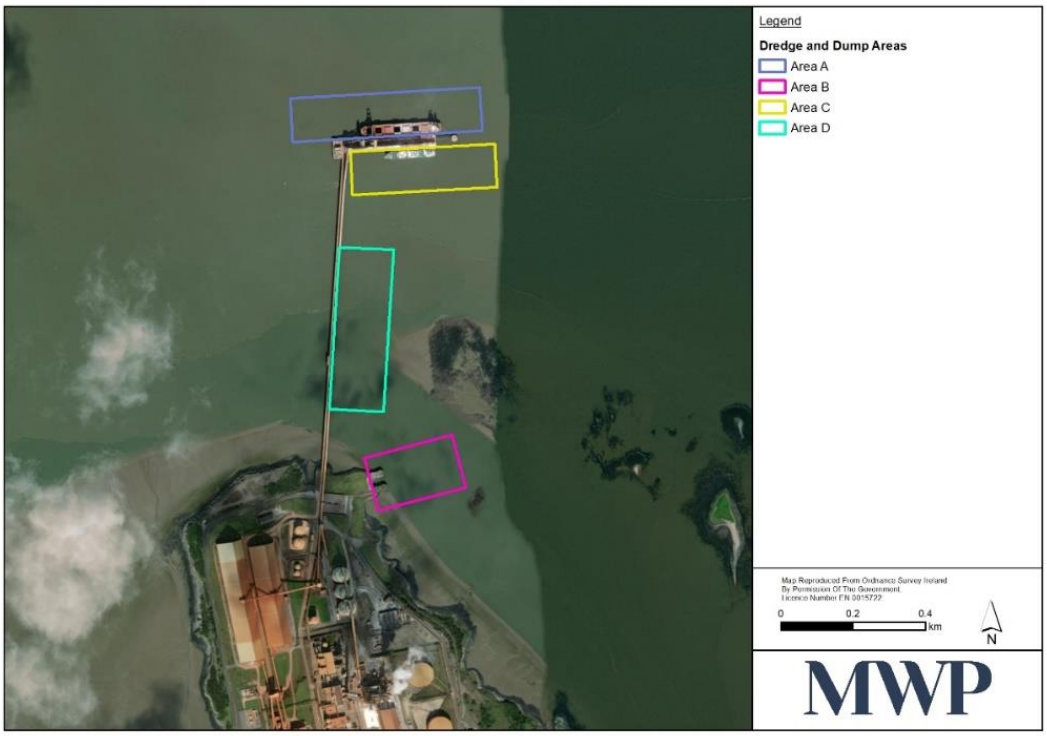


Figure 3: Proposed dredging location areas (courtesy MWP).

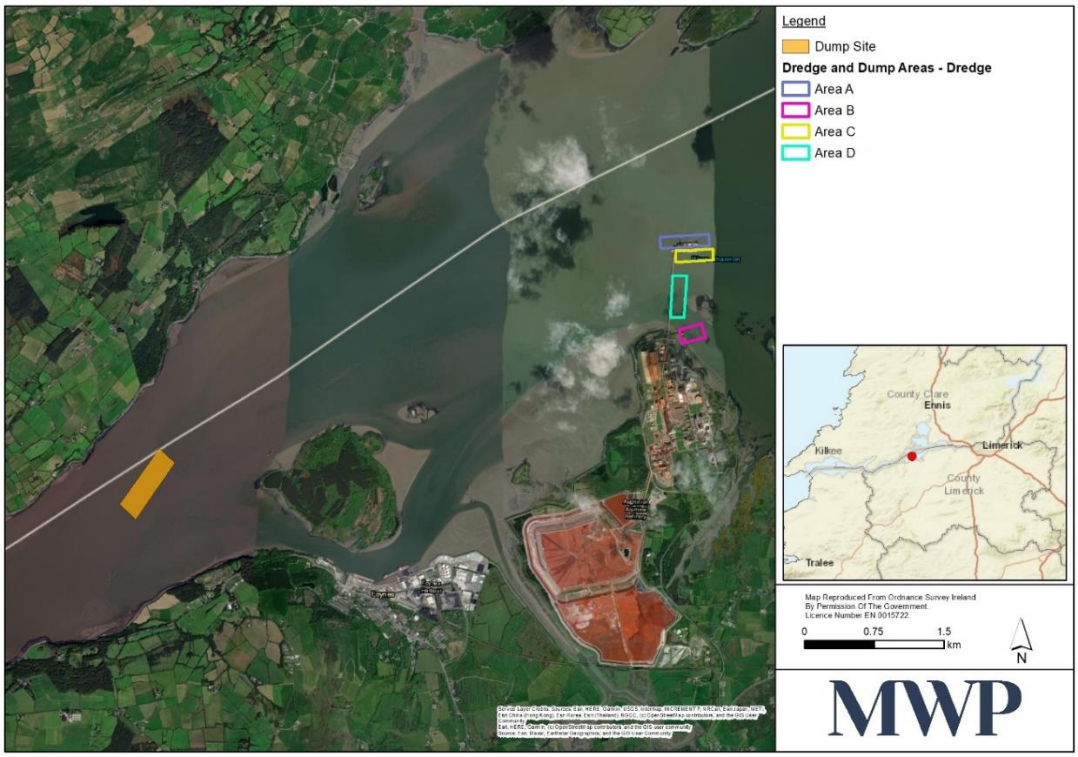
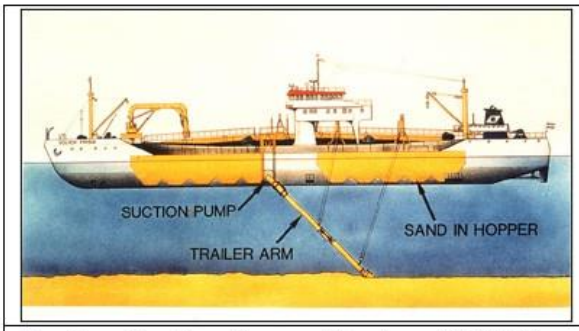


Figure 4: Proposed suction dredged material dumpsite location in orange in Shannon Estuary (courtesy MWP).

Figure 5: Proposed Shannon Estuary dumping site currently used by the SFPC, (courtesy MWP).



Trailing Suction Hopper Dredger (TSHD) in action.

Photograph of a TSHD

Long Arm Reach excavator operating from a barge

Plough Dredger

Figure 6: Proposed dredging vessels (courtesy MWP).

Plate 1: View from south of large jetty extending into the Shannon from Aughinish Point and proposed Area D (LDARCH 2023).

Plate 2: View of large jetty from its most eastern point. Note ships docked in proposed dredging areas A and C (LDARCH 2023).

Area B, known as the 'Cells', comprises of a small maritime landing / service quay that projects eastwards from the shore at Aughinish Point. This modern, somewhat C-shaped, quay was built using curvilinear metal sheet piles driven into the foreshore and then filled with rock and other material in a cellular fashion, hence the name (**Plates 3 & 4**). The proposed dredging at Area C comprises the interior of the 'C' shaped quay and its seaward approach encompassing a total area of *c.*75m x 25m (**Figure 2, Table 1**). The immediate foreshore area from which the Cells have been constructed, comprises modern sterile introduced fill material pushed out from the shore and protected by rock armour extending from the Cells westwards and then southwards for a total of *c.*85 metres, after which it gives way to a rough shingle beach, covered with bladderwrack. At low tide extensive estuarine mud flats extend outwards from the foreshore into Poularone Creek (Seal Creek), (**Plates 5 & 6**).

Plate 3: View from east of service area 'Cells' containing proposed dredging Area B (LDARCH 2023).

Plate 4: View from west of service area 'Cells' containing proposed dredging Area B (LDARCH 2023).

Plate 5: View from south of service area with rock armour and mud flats to the south (LDARCH 2023).

Plate 6: View from south of beach and mudflats south of service area. Note jetty and service area in background (LDARCH 2023).

4 Archaeological & historic background of the Shannon Estuary

4.1 Preamble

The importance of the Shannon Estuary and River as a major maritime / riverine routeway into the heart of Ireland and also as an important economic resource is well attested. Coastal communities availed of and utilised the salt and freshwater estuarine, creeks, corcass, mudflats, reed beds, and its feeder estuaries of the Deel and Maigue rivers on the south shore estuary and Fergus on the north as well as a myriad of other minor rivers and streams to access and positively exploit this immensely rich resource. Dispersed rural settlement sites for these communities were established on the wooded hills and terraces on both sides of the estuary. Fishing was of immense importance, the evidence of which includes many weirs made of rows of wooden stakes and wattling driven into the estuarine foreshore to create linear fish traps of varying forms and dating from all periods. The weirs are preserved in the deep alluvium that creates an anaerobic or anoxic environment.

4.2 Prehistory

Evidence of almost unbroken settlement activity has been recorded along its shores and hinterland extending from the Mesolithic period, c.7000-4000 BC, up to the present day (O'Sullivan, 2001, 3). Mesolithic hunter / gatherer / fisher groups left very little physical evidence behind given their nomadic transitory lifestyle along the coastal fringe estuaries and rivers making their sites very difficult to find. This difficulty is further increased due to rising sea levels that has inundated many of their sites. Ancient, drowned forests and peat bogs have been recorded all along the indented coasts of Kerry as far as the mouth of the Shannon at Beal and along the inner reaches of the estuary itself.

A microcosm of the multi-period activity of the Shannon Estuary is Carrigdirty Rock on the intertidal zone 2km east of the Maigue River mouth. A range over twenty archaeological and palaeo-environmental deposits sites extending from the Mesolithic have been recorded there. A Late Mesolithic plank and associated brushwood were discovered. Neolithic activity included human bones, cattle and other animal and bird bones as well as a stone axe and woven basketry. Evidence of Early, Middle and Late Bronze Age activity has also been recorded there embedded in the exposed peat (O'Sullivan 2001, 69-72).

4.3 Medieval

Settlement in the Early Medieval period (often referred to as the Early Christian or Early Historic periods) is best exemplified monumentally in a secular context by Ringforts. These monuments (generally known by their Irish names Rath and Lios) are one of the most obvious extant monument types in the Irish landscape. These sites consist of circular or roughly circular enclosures with earthen banks and external ditches or fosses. Their size indicates that ringforts were most likely occupied by extended and dispersed family units and were probably largely self-sufficient. The interior would have contained features such as domestic dwellings, outhouses, animal pens, food processing structures, craft areas, hearths and souterrains (for storage and refuge). A mixed economy would have been practised which would have involved cereal growing and animal husbandry, in particular, dairying.

Dominating the landscape, a little south of and overlooking Aughinish, is Shanid an impressive hill-top site with extensive earthworks and structures from the early and high medieval period. Shanid has an imperious commanding aspect in all directions (**Plate 7**). The name is derived from the word seanad a metonym for an important assembly or óenig site.

Plate 7: Shanid Castle, view from east.

4.4 Uí Fidgente

Up to the 10th century the majority of Co. Limerick was dominated by the indigenous Uí Fidgente who were themselves a sept or tuath of the powerful Eóghanacht Caisel (Begley 1906; O'Connor 1987, 8). Their royal residence was at Bruree, more anciently known as Dún Eochair Mhaighe (Begley 1906, 1 & 17). Their territory was divided into two separate kingdoms, the Uí Chonaill and Uí Cairbre with sovereignty alternating between them. These two kingdoms were also sub-divided into a number of smaller tuaths. The territory of the Uí Cairbre was in east Limerick from the Maigue River extending northward to the Shannon much of which comprised a rich fertile plain (ibid 11 & 24).

4.5 Arrival of the Vikings

Viking raids reflected in seven separate entries in the Annals. The first plundering raid occurred in 816 and the last happened in 1176 a time span of three hundred and sixty years. In 834 a fleet of Vikings entered the Shannon and raided Kilpecon and Mungret in the territory of Uí Chonaill. In response a force led by Donnchadh leader of the Uí Chonaill and Uí Fidgente defeated the Vikings at Shanid near Shanagolden. Subsequent fleets of Vikings arrived every ten years or so up to AD876 after which there was a hiatus until AD916. This respite was recorded as a literary trope known as the 'forty years rest' coined by the author of Cogadh Gáedhel re Gallaibh, (Ó Corráin 1996, 224). During the raid in 916 Gebennach, King of the Uí Chonaill was killed and beheaded and taken as a trophy (Begley 1906, 66).

In 922 a Viking raid led by Tomar landed on Inis Sibthon and set up a trading camp there that essentially formed the genesis of the city of Limerick. Inis Sibthon was later called King's Island and is essentially a loop in the Shannon known as the Abbey River (Wiggins 2000, 13). From this base Tomar raided all the holy places on the Shannon from Lough Derg to Lough Ree. Eight years later another Danish fleet landed on Inis Sibthon led by Ivar (Ímar) and apparently joining forces with Tomar from where their combined forces subdued the surrounding country.

After 937 a growing permanency was being established by the Vikings who were becoming more intrinsically involved in native Irish political activity in the area now established on Inis Sibthon. An allegiance between the Uí Fidgente and the Vikings was consolidated by the marriage of Ímar, Norse king of Waterford, to the daughter of Donnubán leader of the Uí Chairbre. It is also likely that Donnubán himself was married to the daughter of the Norse king of Limerick also named Ímar (Ó Corráin 1974, 23; Devane 2013, 2).

During the height of the Viking era, sometime between 950 and 977, Magnus son of Aralt (Harold) settled on Scattery Island and it became a secondary settlement of the Danes of Limerick (Spellissy, 1998 23). In 977 Brian Borimhe (Boru) raided the island slaying all the inhabitants (600-800) that included a mixed Christian population of ecclesiastics and Vikings including the Viking King Ivar or Maghnus and his two sons (ibid 23).

Given its strategic location at the mouth of the estuary Scattery effectively controlled all maritime traffic up the Shannon to Limerick and eventually on through the centre of Ireland in the early medieval period. It would appear that this strategic position turned Scattery into a veritable entrepot for Ireland with the navigable Shannon operating like a modern motorway.

The once powerful ruling dynasty, the Eóganacht, were in decline by the late tenth century following the death of their king, Ceallachán Caisil, in 954. The kingdom of the Uí Fidgente, (whose territory was more or less coeval with the County of Limerick), had also evolved into a number of weaker sub-kingdoms.

4.6 Uí Briain of Dal gCais

Into this power vacuum emerged the Dál Cais dynasty who by this time controlled both sides of the Shannon and were the inveterate enemies of the Uí Fidgente. Mathgamain (Mahon) became their first King of Munster, but it was his brother Brian Boromha (Brian Boru) who was responsible for their ultimate expansion and who was later to become High King of Ireland. In 964 Mathgamain ousted the Eoghanacta from Caisel and expelled the Norse as well. Four years later, at Sulcoit (Solohead) near Limerick Junction, the Dál Cais met and destroyed a combined force of Vikings under the command of Ímar and the Uí Chairbre led by Donnubán as well as Máel Muad king of Eóganacht Raithlind and other allies. Afterwards the Dál Cais pursued their beaten foes into their fort in Limerick and '...slaughtered them in the streets and in their houses. They took away their jewels and their saddles, beautiful and foreign; their gold and their silver, their beautiful woven cloth, both scarlet and green'. The captives were gathered on the hills of Singland and everyone fit for war was killed and the others enslaved as well as taking hostages from Donnubán (Begley 1906, 68-9). Mahon then went to Shanagolden and slaughtered another large Danish settlement. In his absence the remains of the Vikings under Ivar along with others from Waterford attacked Emly where they were again put to flight by Mahon and following which he burned their settlement in Limerick and banished Ivar who returned the following year.

On his return and his instigation Ivar plotted the murder of Mahon with Donnubán and other conspirators. Following which his brother Brian succeeded to the throne and in 978 systematically set out to avenge Mahon by pursuing and destroying all those involved in his murder and fully establishing himself as King of Munster and progenitor of the Uí Briain (O'Brien's).

After this the Limerick Danes never re-engaged in the previous raiding and warfare and essentially commenced more economic commercial activity while still maintaining good relations with and inter-marrying with the Donovans of the Uí Fidgente and at the same time commenced embracing Christianity as well. According to Begley, (ibid 71) the Limerick Danes were first converted by St. Munchin of Bruree whose feast day the 2nd of January is still celebrated in Limerick. The Limerick Christian Danes maintained their own independence and elected their own bishop whose jurisdiction did not extend beyond the limits of the emerging city and adjacent country (ibid). Possibly the first Bishop of Limerick was Gillebert who was consecrated in Ireland sometime around 1103 and afterwards this learned man became Papal Legate. At least two Danes also became bishop, Harald and Turgesius. During Turgesius's residency the city was besieged and captured by Murdoc O'Lochlann before 1167.

Following the destruction of Kincora in 1101 the O'Brien's transferred their power centre to Limerick and became the undisputed rulers of North Munster. In the 12th century the O'Brien's came under increased pressure from the McCarthy's, descendants of the Eoghanacht Caisel who were established in South Munster. In 1168 Domhnall Mór Ua Briain (Donal More O'Brien) became king of Munster and during his entire tenure until his death in 1194 there was bitter rancorous power

struggles with emerging bordering kingdoms. Domhnall Mór was hardly ensconced as king when Rory O'Connor arrived from Connacht with an army and divided Munster into two giving Desmond to the McCarthy's and Thomond to the O'Briens.

4.7 Arrival of the Anglo-Normans

Into this troubled kingdom the Anglo-Normans arrived and in 1171 Domhnall Mór took control back from the O'Connor's with a force that included Cambro-Norman mercenaries led by Robert FitzStephen and also assisted by Diarmait MacMurrough who was a bitter enemy of Rory O'Connor. This was the first military action by the Anglo-Normans in Thomond. When the Normans first arrived in Limerick, they found a long established strongly walled urban centre (Wiggins 2000, 13).

Between 1171 and 1175 there was incessant hostilities often with opposing factions changing sides. In 1174 a combined force of the O'Brien's and the O'Connor's defeated the Anglo-Normans led by Strongbow at Thurles. Shortly after Rory invaded Limerick expelled Domhnall Mór and laid waste the county. The following year a strong force of Anglo-Normans returned led by Raymond Le Gros who found all the bridges broken and the river rapid and wide. Raymond's forces managed to find a fording point and captured Limerick and slaughtered its citizens. However, Raymond was himself immediately besieged by Donal O'Brien. Following a stand-off Raymond agreed to surrender Limerick after hearing of the death of Strongbow after which the Irish razed it to the ground and broke the bridges once more.

In 1177 King Henry made his ten-year-old son John 'Lord of Ireland' and further made speculative grants of the entire kingdom of Thomond including the city to the FitzHerberts who promptly declined as the country was not conquered or subject to Henry. Subsequently Thomond was re-granted to Phillip de Breuse for the service of sixty knights. When de Breuse and other grantees tried to take Limerick Domhnall Mór promptly burned it again forcing the Anglo-Normans to retreat as it was not possible to establish a garrison there. then set about rooting out his neighbouring rivals and forced the O'Donovan's into the lands of the O'Driscoll's in West Cork. Similarly, the McCarthys, O'Sullivans, O'Donoghues and O'Callaghans were pushed into Cork and Kerry.

In 1185 Prince John arrived to secure his colony that had been given to him by Henry ten years previously however Domhnall Mór successfully defended his territories. Another early incursion into the area by the Anglo / Normans is recorded for the year 1189 when Scattery Island and all its churches were laid waste by an English Knight, William Howell or Hoel (Frost, 1893 84).

A more concerted effort took place in 1192 when the Normans undertook several raids into Thomond. Donal again put-up stiff resistance and defeated the Normans again at Thurles. Shortly before his death in 1194 Donal had built defensive castles at Adare and allowed the construction of other castles at Bruis Co Tipperary and others by his son-in-law William de Burgo on his frontiers.

Following the death of Domhnall Mór the Normans further increased their expansion into Thomond which was reduced to the size of present extent of Co. Clare. In 1195 Thomas FitzMaurice FitzGerald, ancestor of the Earls of Desmond, was given lands, originally granted to William de Burgo at Shanid in West Limerick. (MacCotter 2009, 184-5). Thomas was the son of Maurice FitzGerald one of the original Cambro-Normans who arrived with Strongbow in 1169.

Prince John became king in 1199 and continued his interest in affairs in Ireland and promptly appointed Myler FitzHenry as Justiciar whose remarkable ability and military prowess soon established a solid foothold and secured the Norman possessions in Munster and effectively created a permanent settlement in Limerick (Begley 1906, 88). King John gave de Burgo custody of Limerick City. When King John arrived in Waterford in 1210, he was met by Donnchadh O'Brien, son of Donal More and was granted de Burgo's castle at Carrigogunnell as well as the lordship of Thomond for his fealty which lasted until his death in 1242.

During the thirteenth century, the Anglo/Normans had firmly established themselves on both sides of the Shannon Estuary although the O'Connors still held the control of the barony of Iraghticonnor in North Kerry operating out of their stronghold at Carrigaholt near Ballylongford from where they extorted fees from all shipping going up the Shannon. On the shores of the Shannon Estuary several tower-houses were constructed of which Carrigaholt castle was one of the principal residences on the north shore, built *c*.1488 (ibid, 9).

Anglo/Norman settlements were based on a manorial economy leading to more intensified farming and the development of towns and other urban centres (O'Sullivan 2001, 8). The main urban settlement node was Limerick which had been already developed as a town and port by the Vikings and ultimately controlled by the O'Brien, kings of Thomond until 1175 (ibid).

4.8 Ships in the Shannon Estuary

On the 5th of September 1588 a fleet of seven Armada ships anchored in the Shannon Estuary at Carrigaholt in dire need of supplies. A 700-ton Ragusan, the Annunciada, carrying 275 men and 24 guns that had been converted from a merchantman. Nicholas Cahane, the Coroner of Thomond, reported at the time that seven Armada ships had anchored off Carrigaholt. The Spaniards had sent a boat ashore to try and obtain supplies but were refused firstly after offering a barrel of wine for every barrel of water and were again refused even after offering the Annunciada as payment. The vessel was later burned and sank, and the crew were taken off by the six accompanying ships (Dunne 2003).

In 1583 Scattery and the Shannon were granted to the Mayors of Limerick and confirmed by Charter in 1609. The Suzerainty of both was conferred on the Mayor as Admiral of the Shannon. An interesting custom associated with this, when the Mayor of Limerick weds the Shannon by casting a dart or arrow into the river, possibly goes back to the Viking period (Dunne 2003).

The signatures of Turlough McMahon and his son Teige Caech (short-sighted) appear on Sir John Perrot's Tripartite Deed of 1588 (O'Reilly 1979, 12). In 1598 Teige, living up to his name, recklessly seized an English ship that '… had been going astray for some time' and removed its crew and valuables. Teige converted the merchantman into a warship and with three other vessels harried shipping in the Shannon Estuary and effectively blockading the port of Limerick. Teige then proceeded to and took Dunbeg castle that had been pledged and mortgaged a year previously by Teige to a Limerick merchant, Nicholas Stritch. With help from the Sugán Earl of Desmond he beat off an attack from Turlough O'Brien, Earl of Thomond, who had come to retrieve the ship. Teige held Daniel O Brien, brother of the earl of Thomond prisoner in Dunbeg for about a week, eventually releasing him without terms The unrepentant Teige with ample opportunity to sort matters out refused to do so and was subsequently besieged at Carrigaholt by the Earl of Thomond who had

brought a cannon from Limerick to aid him. Teige and his son Turlough escaped in the stolen vessel leaving Carrigaholt that eventually surrendered to the Earl after a siege of four days. The Earl promptly hanged his captives in couples face to face (Westropp, 1911, 33). Teige sailed north to Donegal and fought under Red Hugh O'Donnell's banner at Kinsale in 1601 and was the only Clare chieftain of note to do so.

In the 17th century there were four sieges of the city that had a population of around 3500 making it the third largest city in Ireland. In 1642 the Irish Confederates besieged and captured the castle. In 1651 a Cromwellian army conquered the city. In 1690 an army led by King William attempted to take Limerick but failed. The following year the army returned, and the city finally surrendered under the terms of the Treaty of Limerick. The treaty allowed Irish soldiers to leave and serve in continental armies. These men became known as the "Wild Geese".

The strategic maritime militaristic role of the Shannon continued on to play on into the 19th century culminating with the construction of a Napoleonic Battery on the southern tip of the Scattery Island with a sister battery located on Carrig Island opposite on the Kerry shore near Tarbert (Dunne 2003).

4.9 The terrestrial archaeology of Aughinish

In 1974 three areas of archaeological excavation were undertaken in advance of the construction of the Alumina plant by archaeologists from University College Dublin (UCD 1974: 0025), Ulster Museum (UM 1974: 0027) and University College Cork (UCC 1974: 0028).

Two sub-circular enclosures were excavated by Eamonn Kelly of UCD, both measuring 35 metres in diameter (SMR LI010-017 & 019). The morphology of the enclosures comprised of internal and external limestone slab revetments with rubble cores (Kelly 1974). Kelly suggested that at least one of these enclosures was a house site (LI010-017). Finds during this excavation included coarse pottery, a heavily corroded iron bridle bit, a bronze chisel and pin and two saddle querns. These led Kelly to conclude that the site was occupied exclusively during the Late Bronze Age (ibid).

Another enclosure site was investigated by Helen Hickey of the Ulster Museum, Belfast. The site was of ovoid shape measuring 56.6m N-S x 45m E-W and consisted of a stone bank covered in grass (Hickey 1973-4). Eight burials were recorded inside the enclosure which contained the remains of twelve individuals, male and female from infancy to old age. No grave goods or other datable material associated with these burials was recovered. The presence of sheep bones and their subsequent examination led the excavator to believe that the enclosure probably subsequently functioned as a sheepfold between 1666 and c.1750 (ibid). Iron slag was found beneath the enclosing bank leading the excavator to believe that some iron smelting had taken place on the site before the building of the enclosure. A small hut or shelter was constructed beside the enclosure after the site had fallen into disrepair, the structure partly overlaid the now collapsed enclosing wall. Stray finds of iron included nails, a horseshoe, a hinge pivot and a knife of c16th type. Other finds included fragments of clay pipes, a whetstone, a teapot-lid and a fragment of unglazed pottery (a stoneware costrel handle whose fabric suggests late 16th – early 17th century French or Belgian origin) (ibid).

Excavations were also undertaken by Ann Lynch of UCC around a castle, LI010-020, extending from the keep to just outside the bawn wall. Investigations revealed the bawn wall to be of approximately

2.2m thick and built directly upon the bedrock. The bawn wall was roughly circular with a 3m wide cobbled entrance to the south (Lynch 1973-4). Inside the bawn wall a domed oven was found, containing a thick layer of charcoal and a heavily corroded iron knife. Found within the bawn were 31 skeletons of which 30 were concentrated in one area to the north with the remaining skeleton to the south. Examination of these skeletons revealed that the majority were young children and babies (ibid). Finds from the site included animal bone, sherds of late and post-medieval pottery, a wide range of iron objects, clay pipe fragments, a blue glass bead, a bronze disc-headed pin and an Irish halfpenny dating to the reign of Charles II (1683) (ibid).

Further archaeological testing work was undertaken by Martin Byrne in 1996 when Aughinish Alumina wished to extend the residue storage area of the plant. The remains of an enclosure (site LI010-014) comprising a bank 17m long x 1.23m high was tested. The negative testing results, leading the excavator to conclude that 'the site may be of no archaeological significance" (Byrne 1996, 10).

In 2007 archaeological testing, including geophysical surveying, was undertaken in advance of another expansion of the residue storage area, followed by excavations in 2008 undertaken by Nikolah Gilligan. In 2007 a geophysical survey was first undertaken which was followed by test excavations of any anomalies produced by geophysics. Results of the testing included ten linear features, a burnt spread, possible post-medieval burning, another small area of burning and possible cultivation activity. In 2008 further investigation revealed the burnt spread to be a fulacht fiadh, stakes from which were radiocarbon dated to 1612-1494 cal. BC. Beside the fulacht fiadh was a rectangular structure formed by four groups of stake holes. Evidence of scorching was found within the structure indicating it may have been a hearth. Beneath these features lay an earlier phase of occupation. This phase was comprised of three pits, two lined with hazel wattle. Stake holes found around one pit held the remains of decayed wooden stakes. Charcoal from the base of one of the pits was radiocarbon dated to 2491-2292 cal BC. All other features identified during testing were revealed to be either geological anomalies or else the result of modern agricultural activities.

In 2011 a further expansion of the residue storage area required archaeological monitoring, undertaken by Frank Coyne (2011: 403). Nothing of archaeological nature was found during the monitoring.

4.10 Shipwrecks of the Shannon Estuary

Limericks coastline approximately extends along the south shore of the Shannon River Estuary from near Tarbert in Kerry as far as Limerick City, a distance of just under 60km. The Shannon has been a major conduit for maritime shipping throughout the historic period. Possibly the earliest documented shipwreck occurred in 1127 when several sail vessels were lost near Scattery Island. Another medieval shipwreck occurred in 1318 when an O'Brien ship carrying timber sank in a whirlpool on the north shore (www.irshwrecksonline.net). There are 74 shipwrecks listed for the overall Shannon Estuary area in the unpublished Inventory of Shipwrecks records in the Underwater Archaeology Unit (UAU) of the National Monuments Service (NMS) of the Dept. Arts, Heritage & the Gaeltacht in Dublin. The coast of Limerick accounts for 40 shipwrecks and 34 for the Clare coast. The Shipwrecks Inventory of Ireland is a work in progress by the UAU with current estimates of 15,000

wrecks so far recorded for Ireland. The first volume of which was published for the counties of Louth, Meath, Dublin and Wicklow in 2008 (Brady 2008).

There are no shipwrecks recorded near the proposed dredging works at Aughinish. The nearest recorded shipwrecks are recorded at Foynes Island where at least five wrecks are recorded. The earliest of which is the brig Alice that sank at Foynes Island in March 1814 (www.irishwrecks.com).

In 1822 the Liberty from the UK was lost at Foynes Island (ibid).

In October 1833 the Castleragget was lost at Foynes Island. The Castleragget was a turf boat enroute from Limerick to Ballylongford with passengers when it was hit by a brig. Nine lives were lost (UAU).

In 1890 the Venus was in a derelict condition when it was spotted by the lighthouse keeper on Beeves Rock Lighthouse. The smack sank in the river channel but was not considered a danger to navigation but was subsequently buoyed (ibid). Beeves Rock lighthouse was designed by George Halpin, Inspector of works with the Ballast Board and constructed between 1847-1855.

Also, in November 1890 the schooner Sabrina of Caernarfon was lost at Foynes Island (www.irishwrecks.com).

4.11 Intertidal cultural context of Aughinish

Cartographic research revealed a weir extending out from the foreshore at Aughinish Point in a north-eastern direction for *c.*250 metres south of the proposed dredging works at the Cells, Area B. The weir, comprising a single long fence is denoted on the 1st editions OS map of 1840 but not on subsequent editions (**Figure 7**). On nearby Foynes Island two weirs are located with a further weir located at Durnish Point where Foynes Port is currently located.

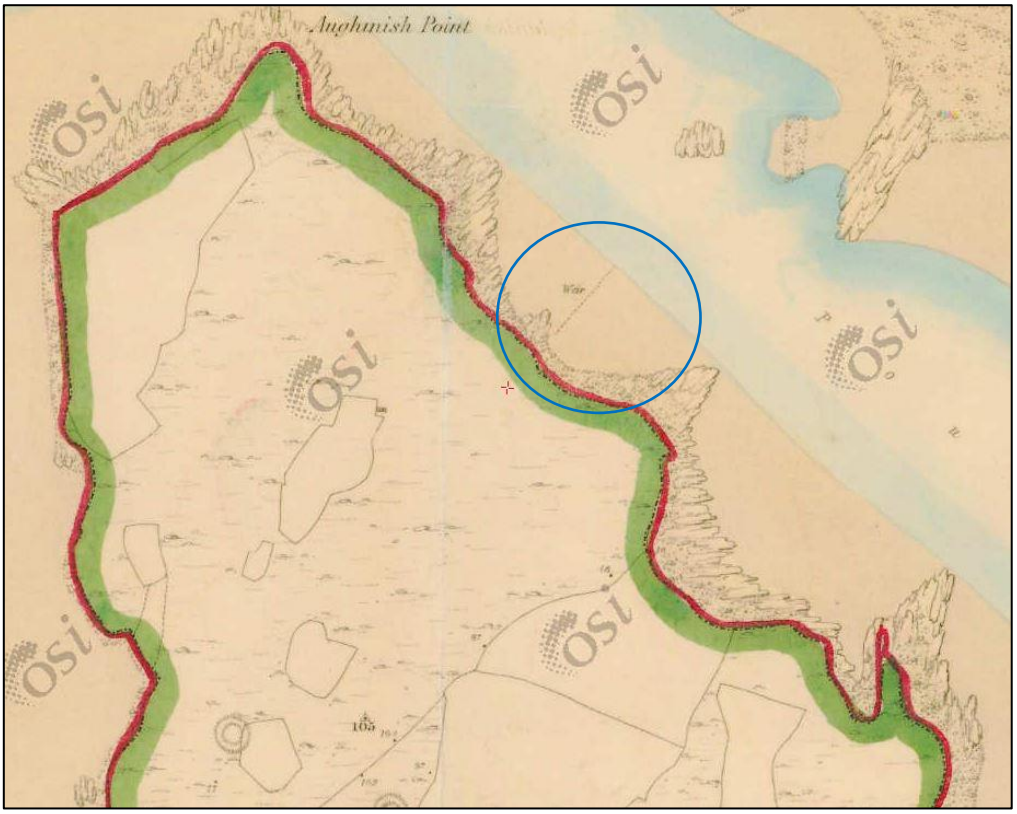


Figure 7: Extract from 1st edition OS map of 1840 showing Aughinish Point. Note weir extending from east shore (encircled).

5 Previous licensed archaeological monitoring

Archaeological monitoring was undertaken in 2016 under licence 16E0415 issued by the National Monuments Service (NMS), (Dunne 2016b). Provision has been made with the management staff of Foynes Port, owners of the dredge vessel Shannon 1, that dredged material could be archaeologically examined on board the vessel and also at the berthing facilities at Foynes.

The results of the monitoring in 2016 were entirely negative.

6 AIA Results

6.1 Field inspection

The entire site was inspected by an experienced field archaeologist in October 2023. No trace of the weir denoted on the 1st Edition OS map was recorded or noted (**Figure 7**). The survey was done entirely from the shore with the aid of binoculars during low tide. No other cultural features were noted or recorded along the shoreline.

6.2 Documentary

- The results of documentary research revealed that there are no shipwrecks recorded for the Aughinish area.
- The results of previous licensed archaeological monitoring of dredging operations at the deepwater jetty and the 'Cells' by Laurence Dunne Archaeology in 2016 were entirely negative (Dunne 2016b).

7 Impacts

7.1 Likely Impact of the Proposed Development on the unknown underwater and foreshore archaeology

- There will be no impact on the known recorded shipwrecks by the proposed dredging works in the wider study area.

- There is a low, possibly benign, possibility of impacting on unknown shipwrecks.

8 Mitigation Measures

- Licensed archaeological monitoring should be undertaken of the TSHD and the long-arm back-hoe dredging works operating from the barge. The monitoring should be undertaken by a suitably qualified underwater archaeologist experienced in such monitoring of marine dredging works. Should the monitoring results be negative then no further licensed monitoring in these areas is deemed necessary.

- The Licensee shall ensure that a dive survey licence is in place to allow for any potential archaeological inspection dives to take place should cultural material need to be assessed during the course of the works.

9 Conclusions

A large corpus of material exists today from several recent and ongoing studies (O'Sullivan 2001) which shows that people have been systematically availing of the rich maritime resources on both shores of the Shannon Estuary from the Stone Age through to the present day. In that context and given: -

- that coherent terrestrial Bronze Age and further settlement activity throughout the Later Medieval has been excavated on Aughinish Island in the 1970s and again in 2007-8.
- that prehistoric and historic weirs and fish traps and wider coastal cultural features and artefacts have been recorded, surveyed and excavated at several locations on the wider shores of the Shannon Estuary,

it is possible that archaeological features or artefacts may be impacted by the proposed long-arm reach back-hoe dredging works in the extended proposed Area B (**Figure 3**). The weir at Aughinish could date to any historical period in that long sequence and further that other weirs may be located in the area concealed in the estuarine mud.

Although, no shipwrecks have been recorded in the study area and while it is understood that three of the proposed dredging areas reflect the moving of material to level the seabed, Area 1 will be subjected to Trailing Suction Hopper Dredging. In that context and notwithstanding the negative results of the three previously monitored plough dredged areas in 2016, it is recommended that the TSHD operations in Area A and the long-arm reach back-hoe dredging from the barge in Areas B,C & D be archaeologically monitored under licence issued by the NMS and a report submitted to the relevant authorities on completion.

10 References

10.1 Documentary

Begley, J. (1906), The Diocese of Limerick Ancient and Medieval, Brown & Nolan, Dublin.

Boland, D. (2008) Maintenance Dredging, Shannon Foynes Port Company, Unpublished Report, Donal Boland, Maritime Archaeologist, Banagher.

Brady, N. (2008), Underwater & Intertidal archaeological Assessment Cable Landfall Locations,

River Shannon Carrowdotia south Td, County Clare, Kilpaddoge & Cloonanoonagh Td, County Kerry, Tarbert to Moneypoint Submarine Cables Project, ADCO

Byrne, M. (1996) Aughinish West, Database of Irish Excavations, www.excavations.ie

Coyne, F. (2011) Aughinish West & Island MacTéige, Database of Irish Excavations,

www.excavations.ie

Devane, C. (2013) 'The Black Castle of Adare': A History of Adare Castle in L. Dunne and J. Kiely, Archaeological Excavation Report Adare Castle, Co. Limerick. Unpublished report Eachtra Archaeological Projects.

Dunne, L. (2003) Archaeological Excavation Report, Carrigaholt Castle, Rinemackaderrig, Carrigaholt, Co. Clare. Unpublished report Eachtra Archaeological Projects.

Dunne, L. (2016a). Archaeological Impact Assessment report, Rusal Ltd, Aughinish, Co. Limerick. Unpublished report Laurence Dunne Archaeology.

Dunne, L. (2016b). Archaeological Monitoring report Aughinish, Co. Limerick, licence no. 16E0415. Unpublished report Laurence Dunne Archaeology.

Cleary, R.M. (2004) Aughinish Co. Limerick, Database of Irish Excavations,

www.excavations.ie

Frost, J. (1978), History and Topography of the County of Clare, Mercier Press, Cork.

Gilligan, N. (2007) Island Mac Téige / Aughinish, Database of Irish Excavations, www.excavations.ie

Gilligan, N. (2008) Island Mac Téige / Aughinish West/Glenbane West, Database of Irish Excavations, www.excavations.ie

Hickey, H (1974) Aughinish Island Site 5, Department of Antiquities, Ulster Museum, Belfast, Database of Irish Excavations, 1974: 0025, www.excavations.ie

Irish Wrecks, www.irishwrecks.com

Kelly, E (1974) Aughinish Island, Limerick, Dept. of archaeology UCD, Database of Irish Excavations, 1974: 0025, www.excavations.ie

Kerrigan, P. (1995) 'Castles and Fortifications of Ireland 1485-1945'. The Collins Press. Cork.

Lynch, A (1974) Aughinish Island Site 7, Limerick, Dept. Archaeology UCC, Database of Irish Excavations, 1974:0028, www.excavations.ie

MacCotter, P. (2009) Medieval Ireland, Four Courts Press, Dublin.

O'Connor, P. (1987) Exploring Limerick's Past, Oireacht na Mumhan Books, Newcastlewest.

Ó Corráin, D. (1974) Caithréím Chellacháin Chaisil: history or propaganda, Éirú 25, 1-69.

Ó Corráin, D, (1996) Vikings 1: 'Forty Years Rest' In Peritia 10, p224.

O' Reilly, U. (1979) 'Carrigaholt's Proud Past.' The Other Clare. 3, 12-15

O'Sullivan, A. (2001). Foragers, Farmers and Fishers in a Coastal Landscape: an intertidal archaeological survey of the Shannon estuary.

Record of Monuments & Places, National Monuments Service online monuments database, www.archaeology.ie

Spellissy, S. 91998) The History of Limerick City, Celtic Bookshop, Limerick.

Underwater Archaeology Unit, Inventory of Shipwrecks of Ireland & the NMS Underwater Archaeological Shipwreck Inventory, www.archaeology.ie

Wiggins, K. (2000) Anatomy of a Siege-King John's Castle Limerick, Wordwell, Bray.

10.2 Cartographic

OSi 1st Edition 6" Maps 1841 www.osi.ie

10.3 Photographic

BING aerial imagery www.bing.com

OSi Ortho-aerial imagery, 2005, 2000 & 1995, www.osi.ie

Site images Laurence Dunne Archaeology Ltd 2023

11 Appendix 1

The coordinates for the dredging/dumping sites and the additional dumping site in the Shannon estuary are provided in the table below. Maps of the five sites are provided in Figures 1-3 below.

Dump Site	Location	ITM_EAST	ITM_NORTH	Longitude	Latitude
Dredge Area A	Northeast	528679.0821	655577.6247	-9.05393973	52.646707
	Northwest	528155.0035	655546.5338	-9.06167606	52.646359
	Southeast	528686.1886	655457.8353	-9.05380886	52.645632
	Southwest	528162.11	655426.7444	-9.061545	52.645283
Dredge Area B	Northeast	528602.051	654616.8376	-9.05487009	52.638063
	Northwest	528360.4415	654552.6123	-9.05842515	52.637454
	Southwest	528640.5861	654471.8719	-9.05426953	52.636766
	Southwest	528398.9767	654407.6466	-9.0578245	52.636157
Dredge Area C	Northeast	528720.9487	655421.2343	-9.0532874	52.645307
	Northwest	528321.2567	655400.0897	-9.05918794	52.645065
	Southeast	528726.6095	655301.3679	-9.05317789	52.644231
	Southwest	528326.9175	655280.2233	-9.05907829	52.643988
Dredge Area D	Northeast	528441.0978	655128.8453	-9.0573586	52.642643
	Northwest	528291.2619	655135.8598	-9.0595737	52.642686
	Southeast	528413.5381	654681.3919	-9.05766875	52.638618
	Southwest	528263.7022	654688.4065	-9.05988364	52.638662
Dumping Area (near Foynes Island)	East	522990.5486	653090.2849	-9.13740437	52.623578
	North	522823.9511	653247.4035	-9.13990112	52.624966
	South	522735.3167	652819.6548	-9.14111	52.62111
	West	522568.5004	652976.979	-9.14361	52.6225

Co-ordinates table courtesy of MWP.