



Parkhouse Farm, Harbottle, Morpeth, Northumberland, NE65 7BD
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BACKGROUND STATEMENT

**Hartley Farm
Holbeach St Mathews
Spalding, Lincolnshire**

**Proposed
Irrigation Reservoir**

Ref No. FP/006/BS June 2016

**Caudwell Farms
Hartley House
Holbeach St Mathews
Spalding
Lincolnshire
PE12 8EW**

1. BACKGROUND

Caudwell Farms farm some 3,000 acres from their centre of operations at Hartley Farm.

With a divers range of crops being grown including, but not exclusively

Vinning Peas
Potatoes
Winter and Spring Wheat
Sugar Beet
Lettuce
Cabbage
Broccoli
Cauliflower

In the light of recent concerns over availability of supply due to changes in weather patterns Caudwell Farms wishing to future proof their faming operations have applied for and been granted by the Environment Agency for a licence for winter abstraction.

The proposal is to construct a winter storage reservoir at Hartley Farm so as to utilise the licence .

2. RESERVOIR DESIGN CRITERIA

The reservoir has been designed with reference to the following:-

Small Embankment Reservoirs; Report 161; CIRIA (Construction Industry Research and Information Association)
Floods and Reservoir Safety: an Engineering Guide; The Institution of Civil Engineers. (*F&RS*)

Freeboard Height

Design Freeboard when full is 0.75m

Fetch	0.25 km	
Average Hourly annual max wind speed	18 - 20 m/s	<i>Fig 3 F&RS</i>
Once in Ten Yearly maximum wind speed	24 - 26 m/s	<i>Fig 4 F&RS</i>
Design Wind Speed assumed	25 m /s	

Using *Fig 9. F&FS* Relationship between effective fetch, wind speed and significant wave height by interpolation

Significant Wave Height 0.3 m

Design Wave Height

Using *Table 2 F & FS* Design Wave Heights

Dam Type	Earth Fill
Crest	Road
Downstream slope	Random grass
Design wave height factor	1.2
Design wave height	= 0.3 m x 1.2
	= 0.36 m
	= 0.4 m

Wave Run Up

Using *Fig 10 F&FS* Ratio of run-up height to design wave height

Dam Slope	1 : 3
Slope characteristic	Smooth
By interpolation Run-up Ratio	1.7
Minimum Freeboard Allowance	= 0.4 m x 1.7
	= 0.68 m
	= 0.7 m

3. ARCHAEOLOGY

The are no known evidence of archaeology on the site which has been intensively cultivated over the years.

Should on stripping the site any evidence be found then Lincolnshire County Councils Historic Environment Team will be advised.

4. PLANNING LEGALISATION

The proposed development can be dealt with under the Prior Notification Procedure for the following reasons:-

The reservoir is reasonable necessary for the purposes of agriculture
The development is being carried out on an area of land of greater than 5 ha
The area of the proposed operations exceeds 0.5 ha
No part of the development is within 25 metres of a metalled part of a trunk or classified road
No excavated material will be removed from the unit. (The spoil from the excavation will be used to construct the walls of the reservoir with any surplus top soil spread adjacent to the reservoir - see appendix i)

5. CONCLUSION

Prior Approval should be granted for the proposed reservoir so as to enable Caudwell Farms to utilise their Winter Abstraction Licence granted by the Environment Agency so that they can future proof the business from the affects of climate change.

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PLANS

FP/006/125 Site Plan

FP/006/01 Plan and typical Section of reservoir

Appendix i

Volume Calculations based on Rectangular Reservoir with

Area of Bottom = 13,000 sq m

Area of Bottom of Proposed Reservoir = 12,880 sq m

Site Hartley Farm

CALCULATION OF RESERVOIR QUANTITIES

11,919,288	Galls
54,179	cu m

Volume above Ground Level

7,226,853	Galls
32,849	cu m

Description

Qty

Unit

Bottom Width of Reservoir

65.00

m

Bottom Length of Reservoir

200.00

m

Ratio of Side Slopes (Wet)

4.00

Ratio of Side Slopes (Dry)

2.50

Depth of Water

3.25

m

Freeboard

0.75

m

Depth of Excavation below existing G.L.

1.50

m

Depth of Top Soil

0.38

m

Bulk Factor for Top Soil

1.00

Width of Bank Top

4.00

m

Height of Bank above Ground Level

2.50

m

Width at Mid Depth of Water

78.00

m

Length at Mid Depth of Water

213.00

m

Width at Top Water Level

91.00

m

Length at Top Water Level

226.00

m

Width at Top of Bank

97.00

m

Length at Top of Bank

232.00

m

Area of Bottom

13,000.00

sq m

Area at Mid Depth

16,614.00

sq m

Area at Top Water Level

20,566.00

sq m

Width of Liner

101.98

m

Length of Liner

236.98

m

Area of Liner

24,168.86

sq m

Surface Area of Excavation @ Sub-Soil level

15,466.00

sq m

Area at Mid Depth of Excavation of Sub Soil

14,212.75

sq m

Overall Width of Reservoir Top of Bank

105.00

m

Overall Length of Reservoir Top of Bank

240.00

m

Overall Width of Reservoir @ Sub-Soil level

119.38

m

Overall Length of Reservoir @ Sub-Soil level

254.38

m

Overall Area of Reservoir @ Sub-Soil level

30,366.02

VOLUMES

Volume of Water Storage in Gallons

11,919,288

galls

Volume above Ground Level

7,226,853

galls

Volume of Sub Soil Excavated

15,997

cu m

Volume of Top Soil Strip

11,387

cu m

Total Volume of Excavation

27,384

cu m

Volume of Bank

25,449

cu m