Scottish Sanitary Survey Project

Restricted Sanitary Survey Report
North Baleshare
UB 490
March 2010

Cefas

Food Standards Agency
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1. Area Overview

North Baleshare is located in North Uist in the Western Isles, Scotland (see Figure 1.1). The North Baleshare production area is an inter tidal zone called Tràigh Leathann between the Isle of Baleshare and North Uist and stretches north of the causeway between the two. Tràigh Leathann is approximately 2 km by 1.8 km at its widest points. It is an intertidal zone drying area with depths of up to 1 m depending on tidal state. A restricted sanitary survey at North Baleshare was conducted in response to receipt of an application to classify the area for commercial harvest of common cockles (*Cerostoderma edule*.).

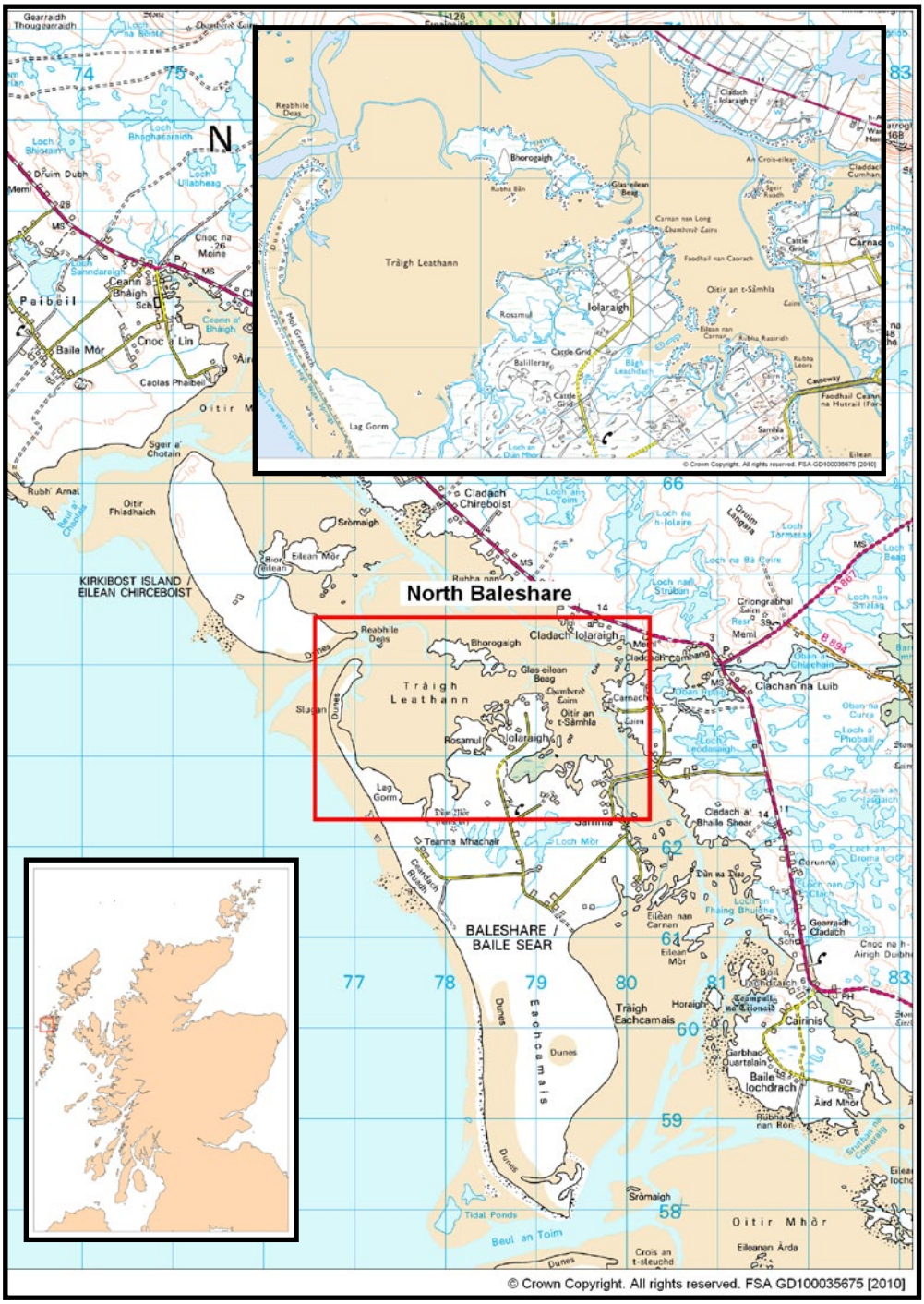

Figure 1.1 Location of North Baleshare

1.1 Land Use

No Land Cover 2000 data was available for the Western Isles at the time of writing this report. Observations made during the shoreline survey indicated that the land surrounding North Baleshare was mainly croft land used for grazing sheep and some cattle.

1.2 Human Population

Figure 1.2 shows the census output areas that are directly adjacent to North Baleshare, from the 2001 census data obtained from the General Records Office. The largest settlement at North Baleshare is the village Clachan na Luib, which during the shoreline survey was noted to have a shop, 8 houses, and a small primary school. Several other smaller settlements have been labelled on the map in Figure 1.2. The remaining population is widely scattered through the area.

This area of the Western Isles is a popular destination for outdoor pursuits and country sports and is visited by tourists daily and there is likely to be an increase in human presence during the summer months. Benbecula Airport is located 7 km south of Traigh Leathann and serves the islands of Benbecula, North and South Uist in the Western Isles of Scotland. The amount of traffic is relatively large considering the small population of the islands (32,692 passengers in 2009; source: Civil Aviation Authority).

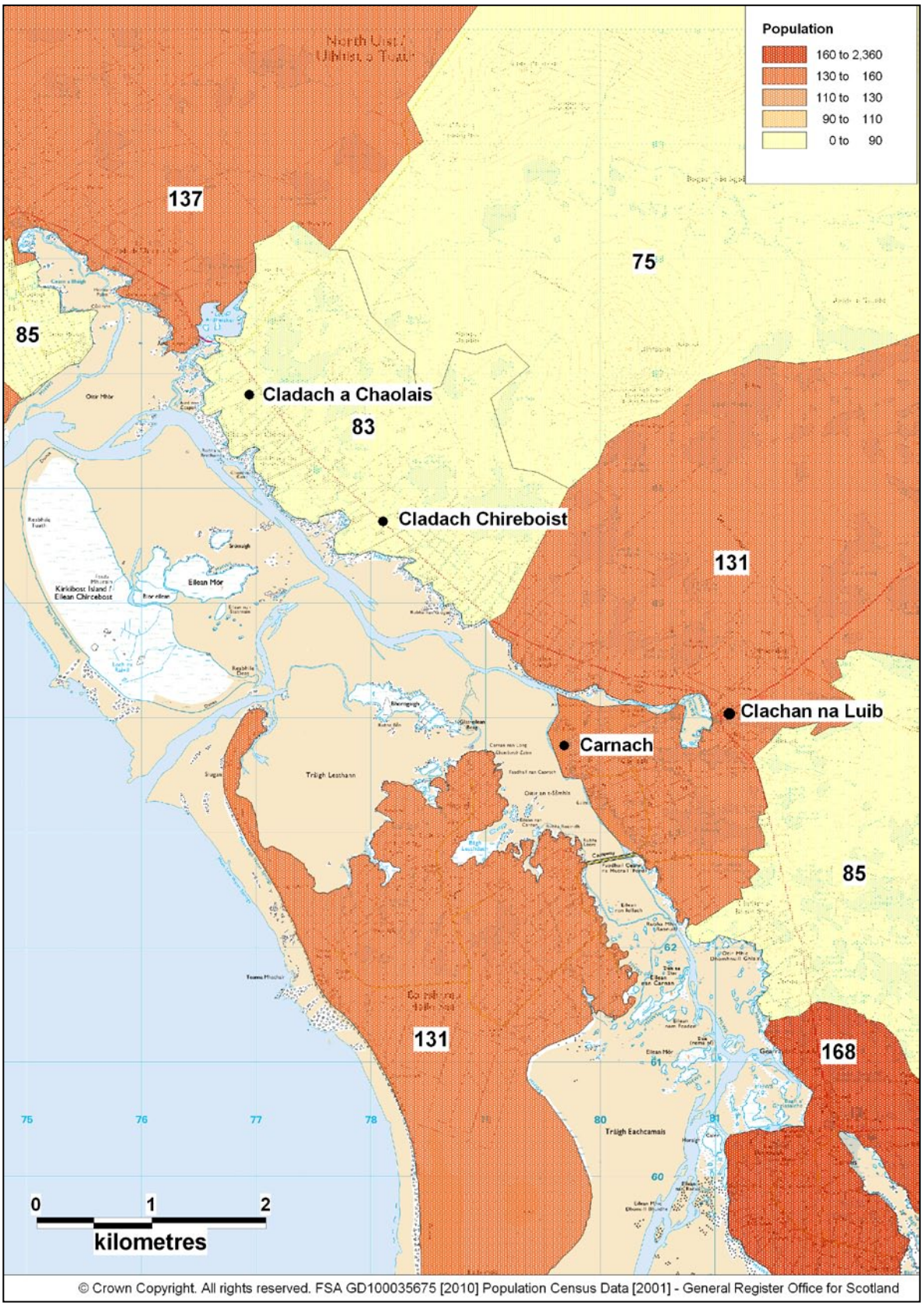

Figure 1.2 Human population surrounding North Baleshare

2. Fishery

The fishery at North Baleshare (UB 490 850 04) is comprised of a wild common cockle (*Cerostoderma edule*) bed.

The cockle bed was identified by the harvester on the classification application form as the sands at Tràigh Leathann “north of the causeway to Baleshare at NF 800 628” (see Figure 2.1).

There is currently no representative monitoring point (RMP) assigned to this area. The cockle bed at North Baleshare does not lie within a designated shellfish growing water.

The cockles will be hand raked and harvesting is planned to take place throughout the year.

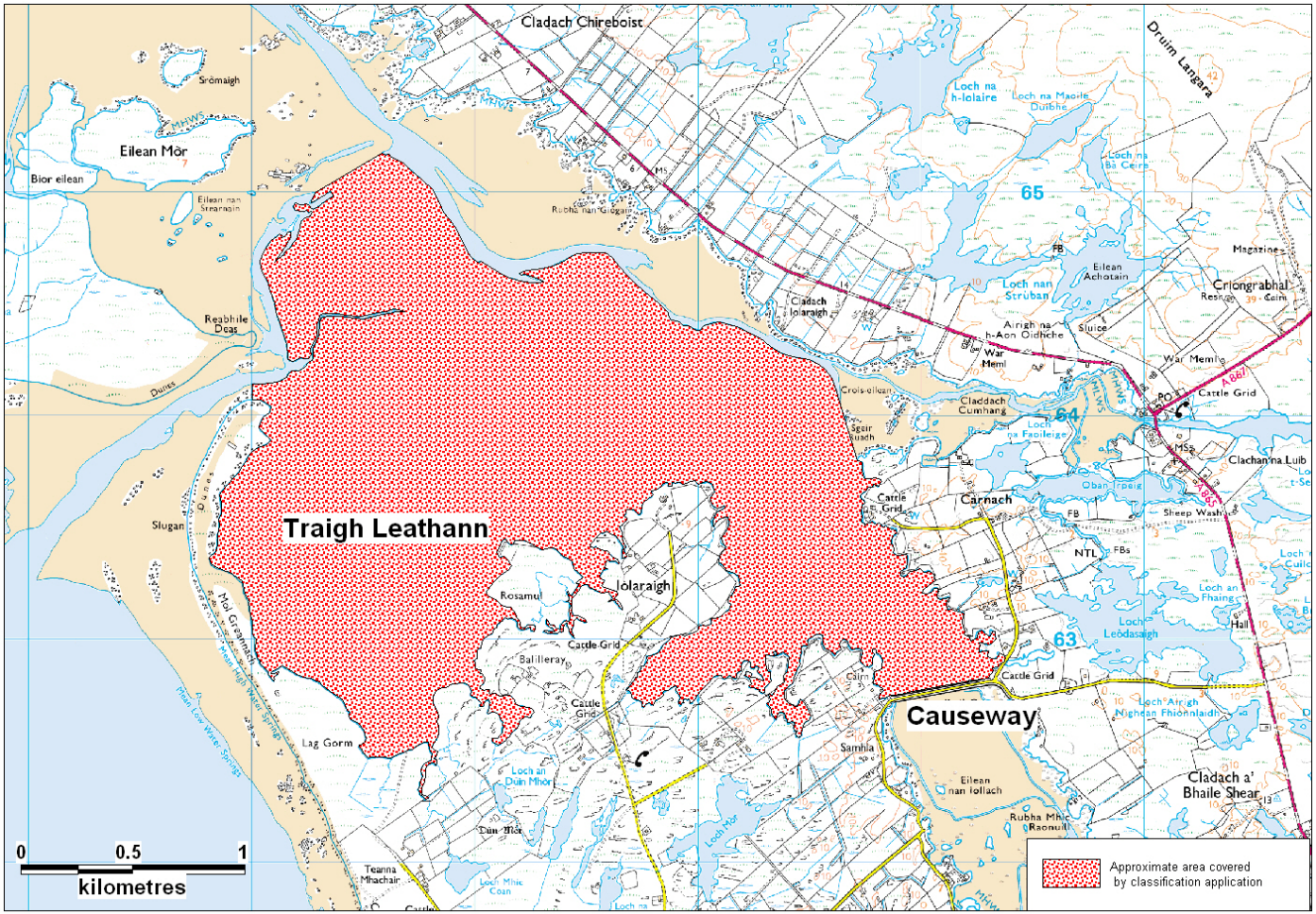

Figure 2.1 North Baleshare fishery

3. Sewage Discharges

A large number of discharge consents have been issued by SEPA for the area surrounding North Baleshare. The majority of these discharge consents are for soakaways. In Figure 3.1 the discharge consents have been thematically mapped to identify soakaways within 400 m of MHWS, soakaways <400 m from MHWS, sewage (private) primary (septic tanks) and sewage (public) primary discharges. Details of the private septic tanks and public primary sewage discharges are listed in Table 3.1. Details of the soakaways are listed in Appendix 4. At the time of writing this report, SEPA had not provided data concerning the consented/design PE or the consented flow m^3/day for any of the discharge consents.

Table 3.1 SEPA discharge consents – sewage (private) primary and sewage (public) primary

Consent No.	NGR of discharge	Discharge Type	Discharges to
CAR/L/1002335	NF 75100 68000	Sewage (public) primary	Oitir Mhor, Bayhead, Isle of North Uist
CAR/L/1080276	NF 75070 68250	Sewage (public) primary	Ceann a Bhaigh, Isle of North Uist
CAR/R/1040334	NF 78581 62666	Sewage (private) primary	Unknown watercourse
CAR/R/1045853	NF 79620 62660	Sewage (private) primary	Sound of Monach, Isle of North Uist
CAR/R/1057691	NF 79990 62140	Sewage (private) primary	Unknown coastal Waters, Isle of North Uist
CAR/R/1059619	NF 79959 62320	Sewage (private) primary	Sound of Monach, Isle of North Uist
CAR/R/1059912	NF 79750 62890	Sewage (private) primary	Sound of Monach, Baleshare, Isle of North Uist
CAR/R/1055686	NF 80750 62900	Sewage (private) primary	Loch Leodasaigh, Isle of North Uist
CAR/R/1066345	NF 80139 63837	Sewage (private) primary	Sound of Monach, Isle of North Uist
CAR/R/1076951	NF 81421 61987	Sewage (private) primary	Otir Mhic Dhomhnuill Ghlais, Baleshare
CAR/R/1041229	NF 81703 61880	Sewage (private) primary	Unknown watercourse, Claddach Baleshare, Isle Of North Uist
CAR/R/1061837	NF 81740 61480	Sewage (private) primary	STE to Loch Fhaing Bhuidhe, Isle of North Uist
CAR/R/1054807	NF 78716 64917	Sewage (private) primary	Coastal Waters, Isle of North Uist
CAR/R/1054711	NF 78708 64958	Sewage (private) primary	Traigh Leathann, Isle of North Uist
CAR/R/1041886	NF 78550 65200	Sewage (private) primary	Sound of Monach, Isle of North Uist
CAR/R/1049576	NF 77210 66770	Sewage (private) primary	Loch Dubhasiridh, Claddach Kyles, Isle of North Uist
CAR/R/1048365	NF 76530 67050	Sewage (private) primary	Unnamed tributary of Beul a Chaolais, Isle of North Uist
CAR/R/1064850	NF 75412 67075	Sewage (private) primary	Sound of Monach, Isle of North Uist
CAR/R/1060042	NF 75570 67250	Sewage (private) primary	Oitir Mhor, Bayhead, Isle of North Uist
CAR/R/1056625	NF 76136 67682	Sewage (private) primary	Oitir Mhor, Isle of North Uist
CAR/R/1048403	NF 75075 67847	Sewage (private) primary	Cean Na Baigh, Isle Of North Uist
CAR/R/1081354	NF 75360 68140	Sewage (private) primary	Ceann a Bhaigh, Isle of North Uist
CAR/R/1030730	NF 73393 68684	Sewage (private) primary	Unnamed watercourse, Knockintorran, Isle of North Uist
CAR/R/1076065	NF 73345 68706	Sewage (private) primary	Loch Sanndaraigh, Knockintorran

Consent No.	NGR of discharge	Discharge Type	Discharges to
CAR/L/1080277	NF 8181 6075	Septic tank	Not provided
CAR/L/1080262	NF 8176 6068	Septic tank	Not provided
CAR/L/1080275	NF 8196 6054	Septic tank	Not provided

Three community septic tank discharges were identified by Scottish Water. These are located 2.9 km south of the causeway at North Baleshare and are detailed in Table 3.2 and mapped in Figure 3.1. They are separate to the public discharges given in Table 3.1.

Table 3.2 Discharges identified by Scottish Water

Consent No.	Discharge Name	NGR of discharge	Discharge Type	Level of Treatment	Consented/ design PE	Consented flow m^3/day
CAR/L/1080277	Cairinish A Primary School Thoraigdh	NF 8184 6077	Continuous	Septic tank	180	13.5
CAR/L/1080262	Cairinish B Trianiadh Bruach Gor	NF 8180 6070	Continuous	Septic tank	100	7.5
CAR/L/1080275	Cairinish C Carabhat	NF 8180 6070	Continuous	Septic tank	88	6.6

No sanitary or microbiological data were available for these discharges. SEPA did not provide information on the discharge consents for these septic tanks. Two of the septic tanks, Cairinish B and Cairinish C relate to the same grid reference; however SEPA has identified that they do not share an outfall pipe.

One sewage outfall pipe was observed during the shoreline survey and this is listed in Table 3.3. The location has been included in the mapped discharges in Figure 3.1. Further details can be found in the shoreline survey report in the appendix.

Table 3.3 Observation of sewage discharge

No	Date	NGR	Description of potential sewage discharge	Sample No.	*E. coli* cfu/100 ml
1	18/03/2010	NF 79007 64856	Sewage outfall pipe	NBFW4	46000

The observed sewage outfall pipe, was flowing sufficiently to sample on the date of the shoreline survey. The fresh water sample returned a result of 46000 *E. coli* cfu/100 ml, which indicates significant faecal contamination.

Despite the relatively low population density in the area as a whole there are a large number of sewage discharges in the area. However, most serve individual dwellings and many discharge to soakaway. A number of those that discharge into, or near, the coastline, may cause localised deterioration in water quality. Three relatively large discharges (considering the population density in the area) are located in the vicinity of Carinish (see Table 3.2) but these are located south of the Baleshare causeway.

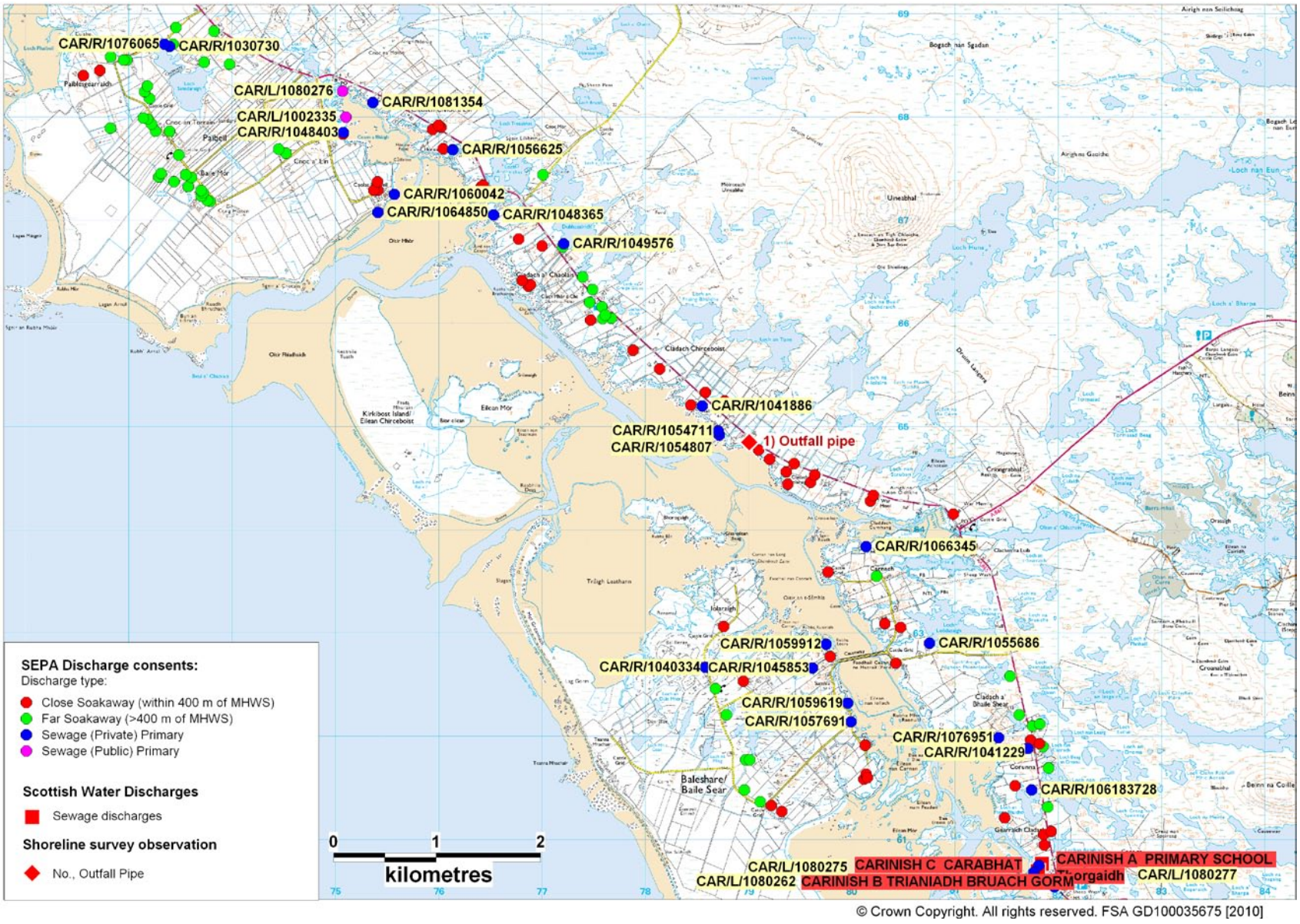

Figure 3.1 Sewage discharges at North Baleshare

4. Animals

4.1 Livestock

Both sheep and cattle are raised through crofting on North Uist (Encyclopaedia Britannica online). Livestock are raised on communal grazing areas, including on machair (sandy grassland). An agricultural show, including livestock, is held on the island in late July/early August each year.

The only significant source of information concerning livestock numbers in the area surrounding North Baleshare was available from the shoreline survey. The shoreline survey relates to the time of the site visits on the 17th March 2010.

On the eastern shoreline, approximately 230 sheep were observed grazing on land close to the shore. On the western shore on Baleshare, a farm was observed with approximately 200 sheep and 50 cattle.

Livestock numbers in the area as a whole are likely to be at their highest during the summer months when calves and lambs are present. During the warmer months livestock may access streams to drink and cool off more frequently, leading to higher levels of faecal contamination in freshwater streams and, potentially, the shellfish bed itself.

The potential impact on microbiological quality of the shellfish is therefore likely to be highest along the eastern shore and to the south of the area, between Baleshare and North Uist.

4.2 Wildlife

During the shoreline survey approximately 11 gulls and 29 oyster catchers, in total, were observed on and around the North Baleshare production area (see Figure 4.1).

No other wildlife was observed at the time of the shoreline survey. However, it is likely that other seabirds may be present in the area. The distribution and numbers of additional species were not investigated.

On the basis of the numbers observed during the shoreline survey, no significant impact from wildlife sources would be expected on the microbiological quality of the fishery. However, the numbers may be greater at other times of the year.

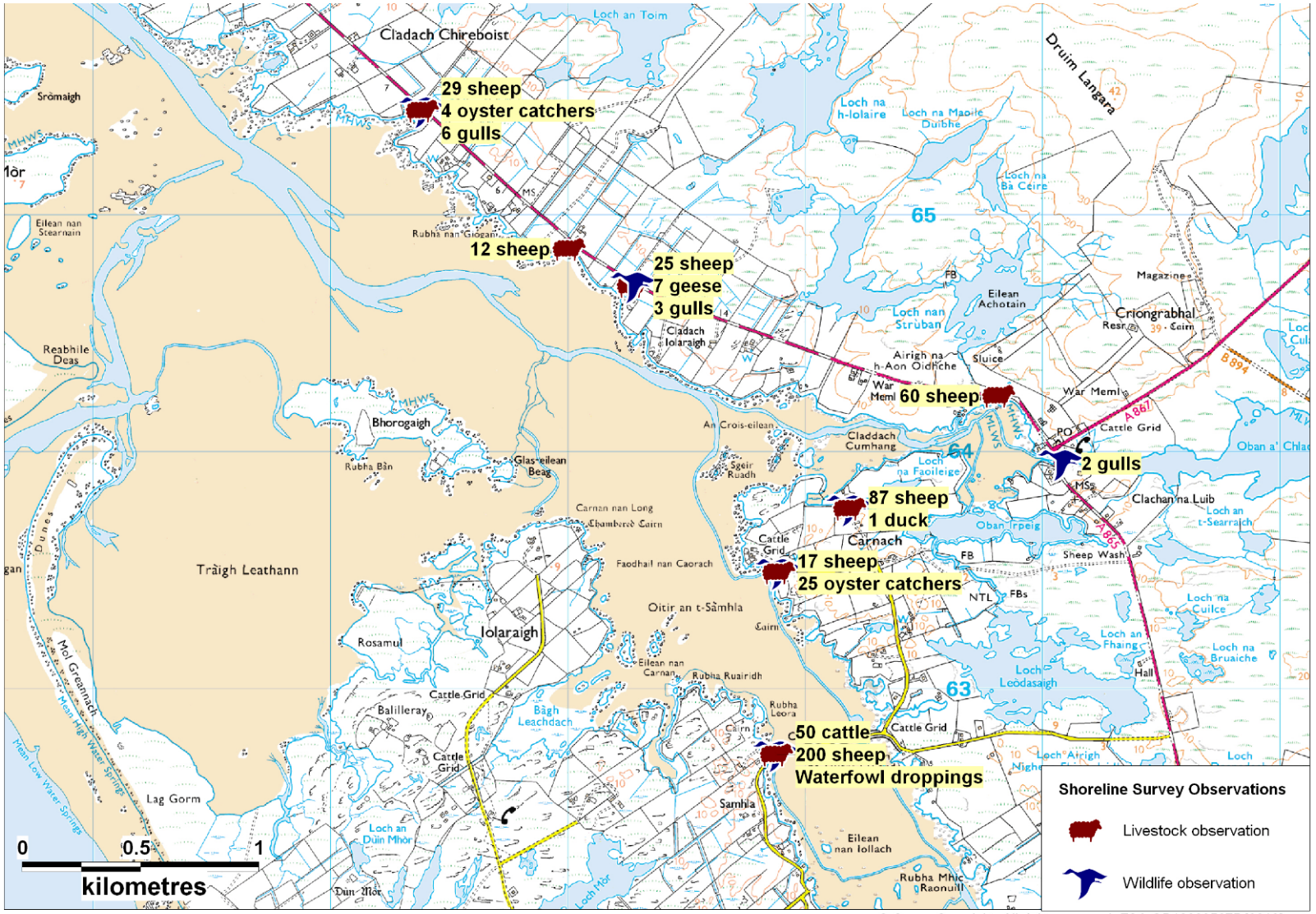

Figure 4.1 Livestock and wildlife present at North Baleshare during the shoreline survey

5. Rainfall

The nearest weather station is located at North Uist: Cllachan na Luib which is approximately 3.7 km east of North Baleshare. Daily rainfall values were purchased from the Meteorological Office for the period 01/01/2003 to 30/09/2007 inclusive for the North Uist: Clachan na Luib weather station. For this period of 1664 days, total daily rainfall was not recorded for 260 days, including the entire months of July 2003, June 2004, October and December 2005, March and April 2006, and February 2007. Due to the close proximity of the weather station to North Baleshare, rainfall recorded here is likely to be very similar to that experienced in the bay and the surrounding land.

High rainfall and storm events are commonly associated with increased faecal contamination of coastal waters through surface water run-off from land where livestock or other animals are present, and through sewer and wastewater treatment plant overflows (Mallin et al. 2001, Lee and Morgan 2003).

The influence of rainfall on microbiological quality will depend on factors such as local geology, topography, land use and sewerage infrastructure.

5.1 Rainfall at North Uist

Due to the missing data it is not appropriate to present total rainfall at North Uist by year or month. Instead, Figures 5.1 and 5.2 summarise the pattern of rainfall recorded at North Uist. The box and whisker plots present the distribution of individual daily rainfall values (observations) by year (Figure 5.1) or by month (Figure 5.2). The grey box represents the middle 50% of the observations, with the median marked as a line within the box. The whiskers extend to the largest or smallest observations up to 1.5 times the box height above or below the box. Individual observations falling outside the box and whiskers are represented by the symbol '*'.

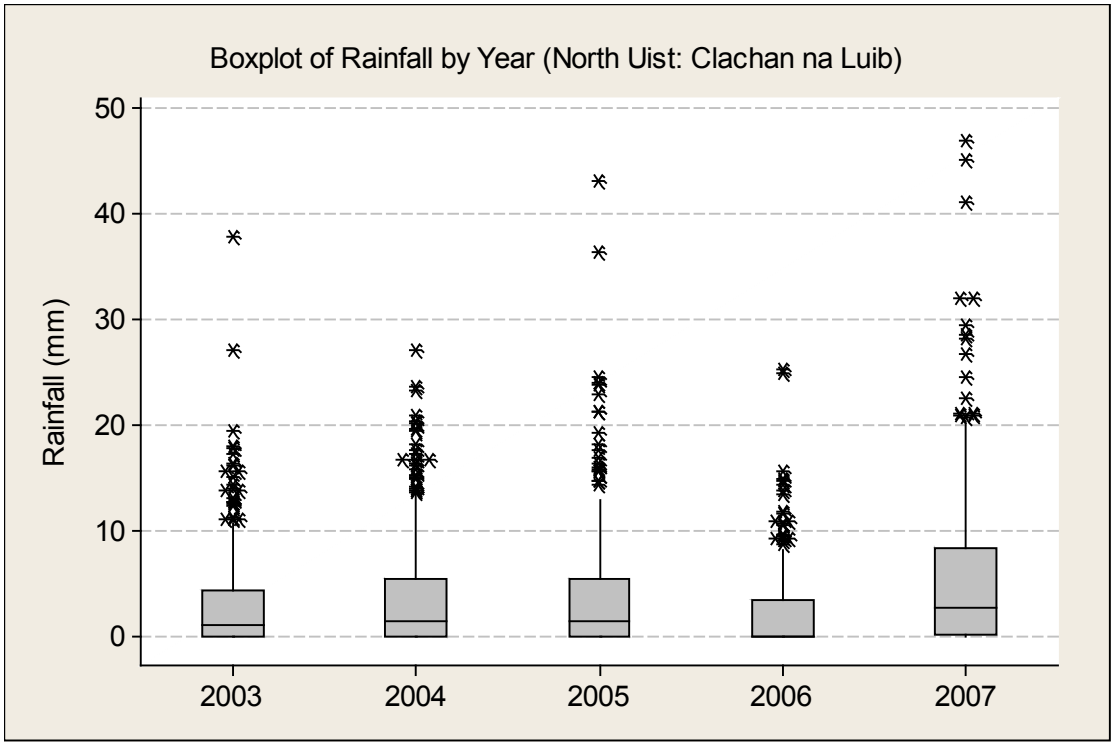

Figure 5.1 Boxplot of daily rainfall at North Uist by year

Figure 5.1 shows that there was significant variation in the median daily rainfall from year to year. Overall, 2006 was a dry year in this area and saw the lowest median rainfall. The highest individual rainfall events occurred in 2005 and 2007.

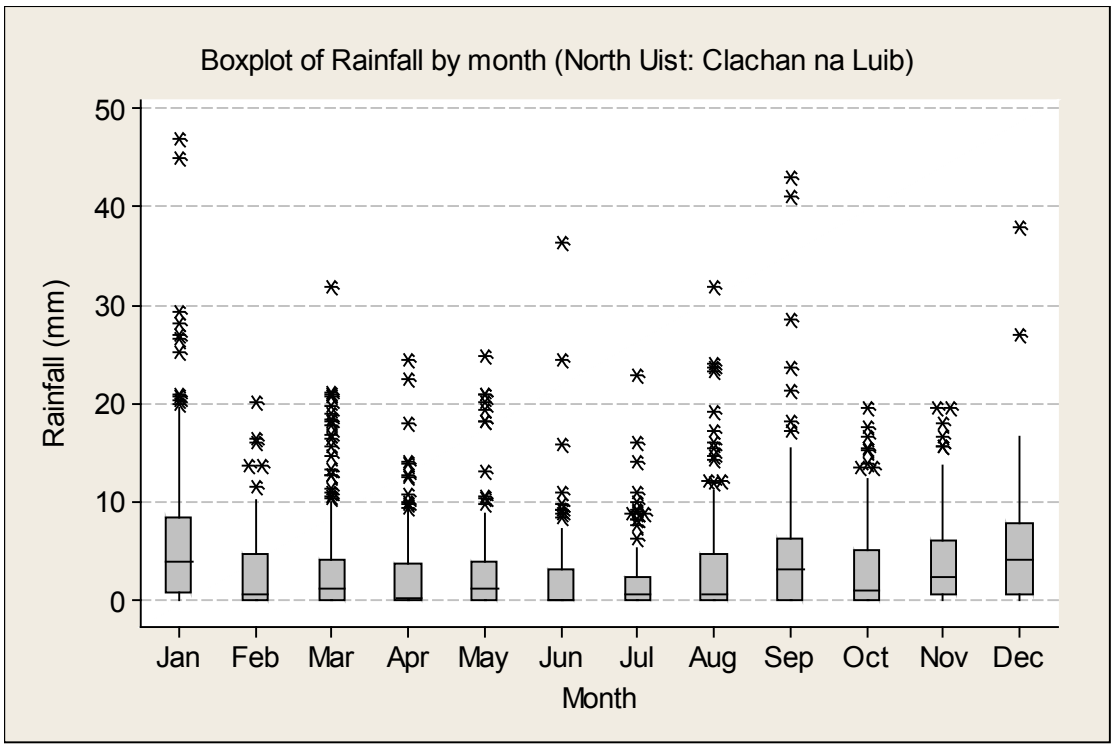

Figure 5.2 Boxplot of daily rainfall values at North Uist by month

The wettest months were December and January, but the high individual rainfall events occurred throughout the year, although not in all individual months. For the period considered here (2003 – 2007), 36% of days for which records were available experienced no rainfall while 47% of days experienced rainfall of 1mm or less. Although the mean rainfall was 4 mm per day, there were 8 occasions where daily rainfall exceeded 30mm. The highest daily rainfall recorded (47mm) fell in January 2007.

Periods of increased rainfall are generally associated with higher levels of contaminated surface water runoff. Marked changes in the level of rainfall may also cause significant wash off of accumulated material.

6. River Flow

There are no river gauging stations in the vicinity of North Baleshare. A total of seven fresh water inputs were observed discharging into the area during the shoreline survey. These streams represented the largest freshwater inputs to the area and are listed in Table 6.1 and mapped in Figure 6.1. There was no rainfall on the day of the survey.

Table 6.1 Stream flow and loadings – North Baleshare

No	Grid Ref	Description	*E. coli* (cfu/ 100 ml)
1	NF 81080 63949	Stream	200
2	NF80816 64234	Stream	<100
3	NF 78388 65439	Stream	<100
4	NF 79276 64701	Stream	<100
5	NF 80177 63125	Stream	<100
6	NF79880 62720	Stream	<100
7	NF 77984 62812	Stream	<100

At the time of the shoreline survey, there were seven streams flowing. Water samples were taken from all of these streams. The stream located on the far eastern side of the site had a result of 200 *E. coli* cfu/100 ml, the rest of the streams has results of < 100 *E. coli* cfu/100 ml. *E. coli* contamination of these watercourses was therefore low on the day of the survey. It would be expected that levels of faecal contamination in the streams would increase significantly after more extensive rainfall.

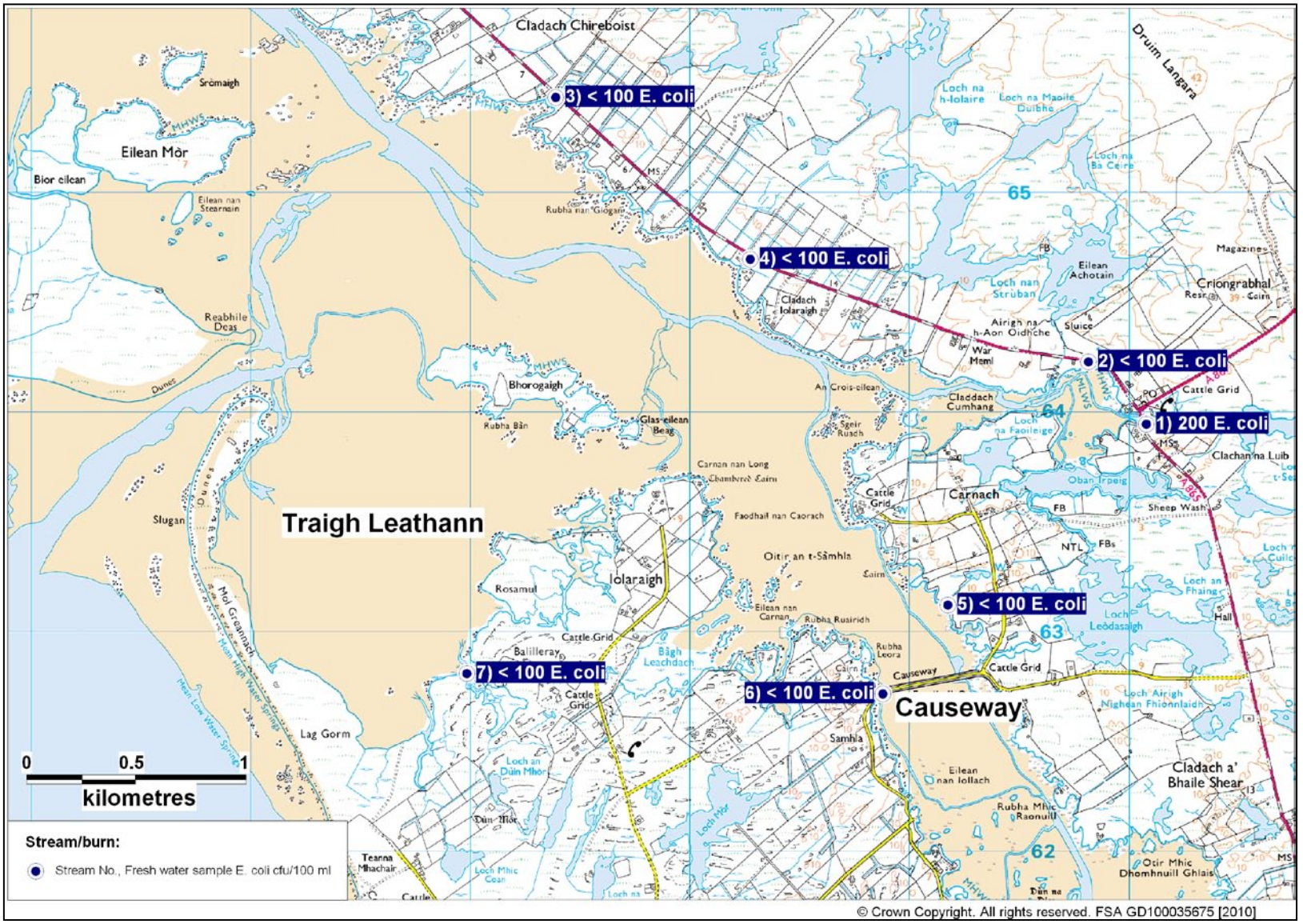

Figure 6.1. Location of streams and fresh water sample results at North Baleshare

7. Historical *E. coli* Monitoring Data

There is no historical *E. coli* monitoring data available for North Baleshare.

8. Bathymetry and Hydrodynamics

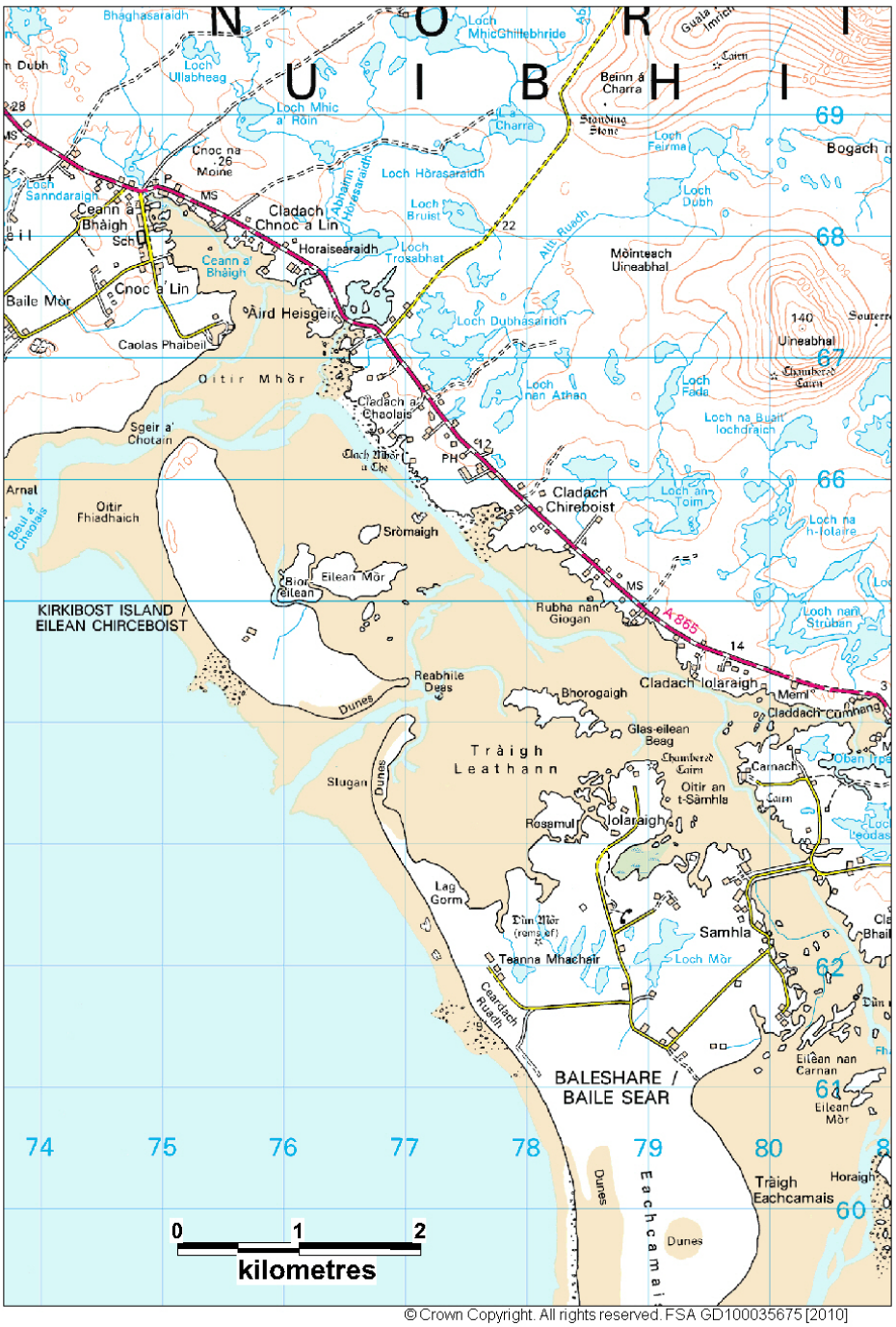

Figure 8.1 North Baleshare OS map

Electronic hydrographic data was not available for the North Baleshare area. The Ordnance Survey map shows that much of the area is intertidal (see Figure 8.1) and it is shown as a drying area on Admiralty charts. Charts also show that, with distance from the coastline of Baleshare island, the depth increases from a drying area to depths of up to 50 m. The causeway between Baleshare and North Uist does not contain a bridge or pipe and so there is no seawater connection between the channels north and south of the causeway.

8.1 Tidal curve and description

The two tidal curves below are for the port of the Balivanich, the nearest secondary port. This is located approximately 1 km south-west of the western end of Beul au Toim and is thus relatively close to the fishery. The curves have been output from UKHO TotalTide. The first is for seven days beginning 00.00 GMT on 9th March 2010. The second is for seven days beginning 00.00 GMT on 16th March 2010. Together they show the predicted tidal heights over high/low water for a full neap/spring tidal cycle.

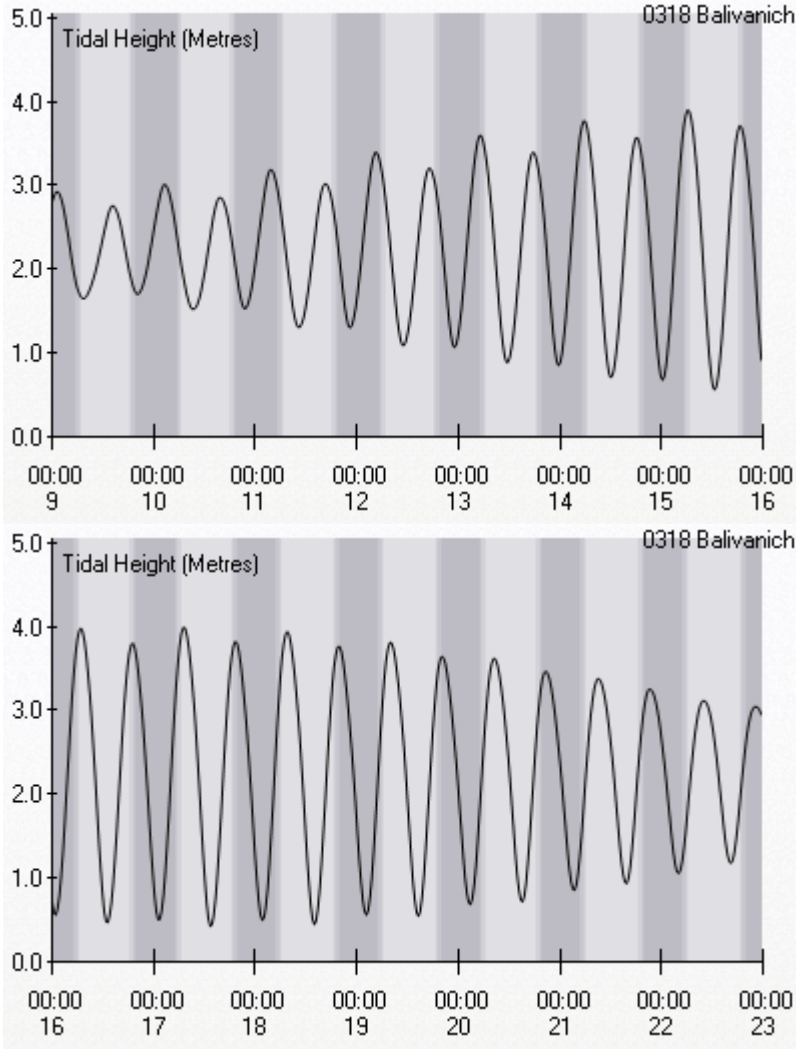

Figure 8.2 Tidal curves for Balivanich

The following is the UKHO summary description for Balivanich:

The tide type is Semi-Diurnal.

MHWS	4.1 m
MHWN	3.1 m
MLWN	1.5 m
MLWS	0.5 m

Predicted heights are in metres above chart datum. The tidal range at spring tide is therefore approximately 2.6 m and at neap tide 2.6 m.

8.2 Currents

There is no Admiralty tidal flow information for points close to Baleshare. Scottish Sea Kayaking (Cooper and Reid, 2005) indicates that the average spring flows to the west of Baleshare are of the order of 2 knots (approximately 1 m/s) with the northerly flood occurring approximately 4 h 30 m before HW Ullapool and the southerly ebb tide occurring approximately 1 h 55 m after HW Ullapool. Average neap flows will be approximately half of this.

Given the barrier imposed by the causeway between Baleshare and North Uist, the flooding tide will enter the area through the channels at the north and south ends of Kirkibost Island and flood across the intertidal areas, initially following the main channels. Given the broader gap to the north of Kirkibost Island, it is likely that a greater volume of water will pass through there, although currents may be less at that point than at the south of the island. The tide will then submerge the intertidal areas, including the area up to the causeway. The opposite will happen on the ebb tide.

8.3 Conclusions

The area is generally very shallow and water movement is constrained. Therefore, there will be relatively little dilution of any contamination arising within the area itself. Contamination arising on the eastern shore of the area will tend to be carried towards the causeway on the flooding tide. Contamination arising in the area near the causeway will tend to be taken over the intertidal area between Baleshare and North Uist on the ebbing tide and then past Bhorogaigh. Some of this could impact on the northern part of Tràigh Leathann. The latter sands could be affected by sources outside of the area, but these would be subject to significant dilution.

9. Shoreline Survey Overview

A restricted shoreline survey of the North Baleshare shoreline was undertaken by staff from Comhairle nan Eilean Siar Council on the 17th March 2010.

Sub-surface sea water samples were taken from two points within the shellfish bed area. Both samples were taken just north of the causeway on either side of the channel. The sample taken on the eastern side had a low result of 3 *E. coli* cfu/100 ml and the sample taken on the western side had a slightly higher result of 25 *E. coli* cfu/100 ml.

Fresh water samples were taken all along the coastline of North Baleshare at any streams or burns flowing at the time of the shoreline survey. From the seven fresh water samples taken from streams or burns, six had results of <100 *E. coli* cfu/100 ml and one sample, taken from the far eastern shoreline of the site had a result of 200 *E. coli* cfu/100 ml.

Common cockle samples were collected from two points within the North Baleshare shellfish bed. A cockle sample collected close to the causeway a result of 490 *E. coli* MPN/100 g. A second cockle sample taken north of the first sample had a result of 270 *E. coli* MPN/100 g.

A single sewage outfall pipe was observed during the shoreline survey. A fresh water sample was taken from the outfall and returned a very high result of 46000 *E. coli* cfu/100 ml.

During the shoreline survey, a large number of livestock, approximately 430 sheep and 50 cattle in total were seen grazing in crofts close to the shoreline of North Baleshare.

A map is provided in Figure 9.1 that shows the relative locations of the most significant findings of the shoreline survey.

In summary, identified sources of potentially significant contamination are:

- Contaminated freshwater streams flowing into the North Baleshare site
- Sewage outfall pipe located on the north eastern shoreline of the north Baleshare site
- Large numbers of livestock grazing on the shoreline

However, only one of the many potential sources of sewage contamination in the area was located during the survey.

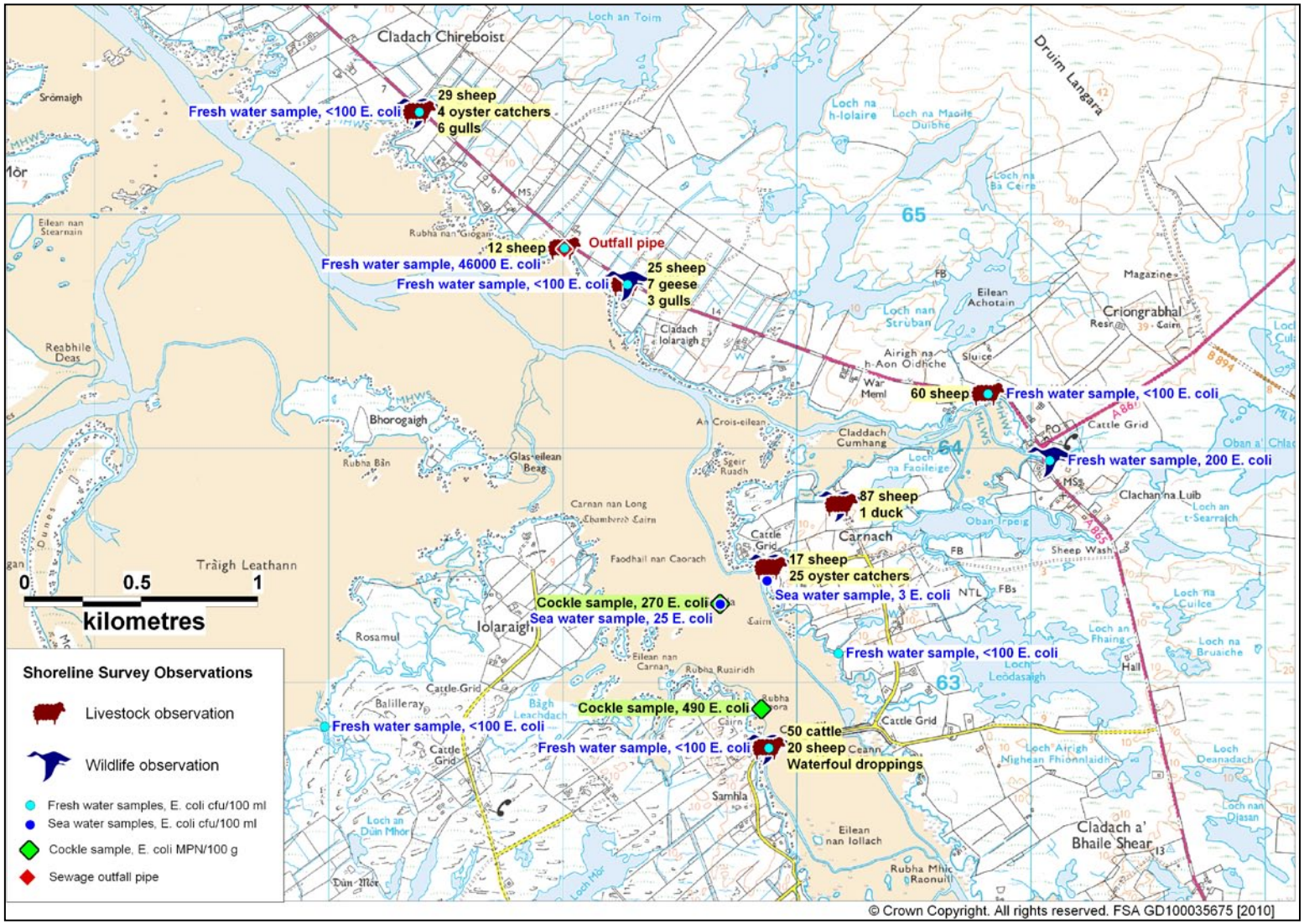

Figure 9.1 Summary of shoreline observations

10. Overall Assessment

Fishery

The common cockle bed is located within the North Baleshare production area. The cockle bed was identified by the harvester on the classification application form as the sands at Traigh Leathann which are north of the causeway to Baleshare at NF 800 628. The cockles will be hand raked and harvesting is expected to take place throughout the year.

Human sewage inputs

A large number of consented discharges are present in the area surrounding North Baleshare. The majority of these discharge consents are soakways, 53 out of 109 soakaways are within 400 m of the shoreline and could therefore have some potential to impact the fishery. There are also 22 private septic tank discharges and 2 public primary sewage discharges to sea. The majority the discharges are located to the east of the shellfish bed and are also concentrated on the eastern and western shorelines, north of the causeway.

During the shoreline survey, onesewage outfall pipe was observed northeast of the Traigh Leathann site.

Although there were a large number of sewage discharges over 1km north of the fishery, localised impacts from discharges at the south end of the shellfish bed are most likely to impact on the microbiological quality of the shellfish.

Agricultural inputs

During the shoreline survey a large number of livestock (approximately 430 sheep and 50 cattle in total) were seen grazing along the shoreline surrounding North Baleshare. On the eastern shoreline of the Isle of Baleshare, close to the causeway 50 sheep and 20 cattle were observed. On the shoreline adjacent to the Isle of Baleshare, another two groups of 104 sheep and 60 sheep were observed. These three groups represented the largest concentrations of livestock close to the shellfish bed. Often the livestock were close and/or had access to the shoreline and were close to fresh watercourses. Due to the close proximity of the livestock to the shoreline and watercourses, agricultural sources may be a significant source of contamination to the area. The southern extent of the shellfish bed, just north of the causeway, had the largest concentration of livestock. Therefore, this part of the shellfish bed is likely to experience the largest amount of contamination from these sources.

Wildlife inputs

During the shoreline survey approximately 11 gulls and 29 oyster catchers were observed on and around the North Baleshare site. This is a relatively small number and unless markedly greater numbers are present in other times of the year, their contribution to any contamination of the shellfishery will be small.

Rivers and streams

A total of seven watercourses were discharging into North Baleshare at the time of the shoreline survey. Out of the seven streams sampled six had results of <100 *E. coli* cfu/100 ml and one sample, taken from the far eastern shoreline of the site had a result of 200 *E. coli* cfu/100 ml.

Although the concentrations of faecal bacteria found in the streams during the shoreline survey were relatively low, it is expected that these may not be representative of the maximum concentrations that would be found at other times of the year. It is anticipated that *E. coli* concentrations found in these streams will vary markedly with time and would be higher after significant rainfall following a dry period.

Rainfall

Rainfall patterns at North Uist: Cllachan na Luib (the nearest rainfall station) show that seasonal variation in rainfall levels occurs and the wettest months were December and January. An increase in rainfall following a dry period may be expected to wash a flush of bacteria from the surrounding land into the production area. The highest risk of this type of event is during July and August, when lower average daily rainfall and extreme daily rainfall events are most likely to occur. The impact of rainfall events is likely to be most acute nearest where the streams enter the shellfish bed.

Analysis of results

There are no historical *E. coli* monitoring results for North Baleshare.

During the shoreline survey, two cockle samples collected from points within the southern half of the cockle bed had results of 490 *E. coli* MPN/100 g and 270 *E. coli* MPN/100 g, indicating moderate levels of faecal contamination. The higher result came from just northwest of the causeway, where there were a large number of livestock and consented septic tank discharges (though the discharges were not observed).

During the shoreline survey, two seawater samples were taken further north of the causeway on either side of the channel. The sample taken on the eastern side had a low result of 3 *E. coli* cfu/100 ml and the sample taken on the western side had a slightly higher result of 25 *E. coli* cfu/100 ml, indicating that levels of faecal contamination are higher along the western shore at this end of the fishery.

A water sample taken from a sewage outfall pipe located on the north eastern shore, north of the shellfish bed, returned a high result of 46000 *E. coli* cfu 100 ml. This would have the potential to cause significant contamination.

Movement of contaminants

Contamination arising within the area will be subject to relatively little dilution. That arising on the eastern shore of the area will tend to be carried towards the causeway on the flooding tide. Contamination arising in the area near the

causeway will tend to be taken over the intertidal area between Baleshare and North Uist on the ebbing tide and then past Bhorogaigh. Some of this could impact on the northern part of Tràigh Leathann. The latter sands could be affected by sources outside of the area, but these would be subject to significant dilution.

Overall conclusions

Although there is the potential for localised sewage contamination at several points around the fishery, primarily due to the presence private septic tanks, the area immediately north of the causeway will tend to be impacted most by both animal and human sources, with the former likely to predominate. The moderate levels of contamination seen in cockle samples taken during the shoreline survey support this to some extent, although samples were only taken from the south side of the cockle bed. The main are of sands at Tràigh Leathann should be subject to lower levels of contamination.

11. Recommendations

Production area

The recommended production area is as follows: Area bounded by lines drawn between NF 7697 6407 and NF 7702 6435 and between NF 7702 6435 and NF 7700 6526 and between NF 7700 6526 and NF 7834 6526 and between NF 7980 6426 and NF 7980 6385 and extending to MHWS.

This area covers the entire extent of the area included in the classification applciation, while excluding potentially more contaminated areas to the north and to the east.

RMP

The recommended location is at NF 7986 6315. This is in the area expected to experience the most consistently high levels of contamination.

Tolerance

The recommended tolerance is 100 m. This should allow sufficient stock to be collected for testing, given the potential for variability in occurrence and density of wild stocks, while ensuring that sampling takes place sufficiently close to the intended location.

Frequency

Given that there is no historical data for the area, it is recommended that sampling be undertaken monthly until sufficient data has been obtained for review.

The recommendations are summarised in Figure 11.1 and also presented in Appendices 1 and 2.

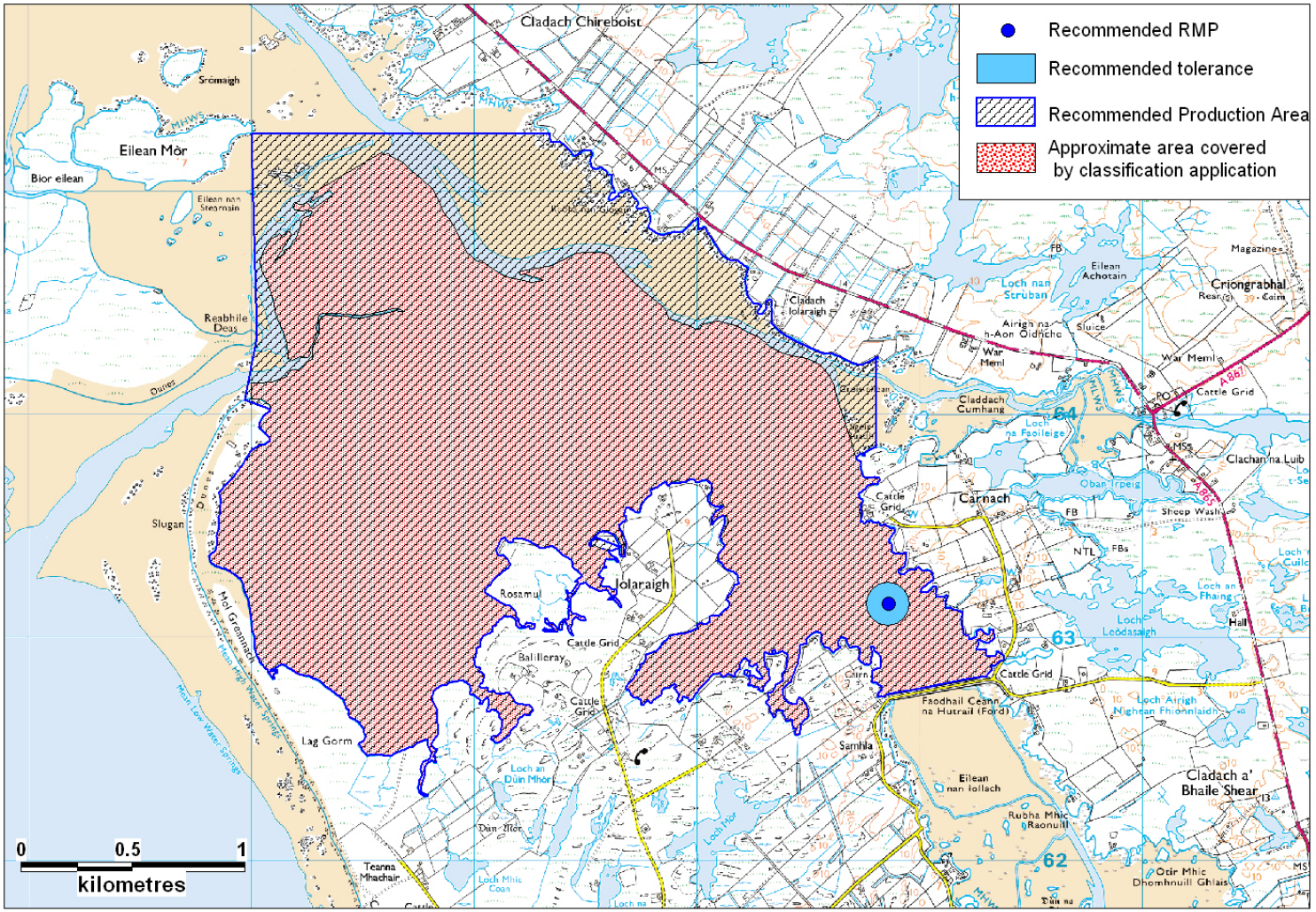

Figure 11.1 Recommendations for North Baleshare

12. References

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13. List of Figures and Tables

Tables

Figures

Appendices

1. **Summary Sampling Plan**
2. **Comparative Table of Boundaries and RMPs**
3. **Shoreline Survey Report**
4. **SEPA Discharge consents - Soakaways**

Sampling Plan for North Baleshare

PRODUC-TION AREA	SITE NAME	SIN	SPECIES	TYPE OF FISH-ERY	NGR OF RMP	EAST	NORTH	TOLE R-ANCE (M)	DEPTH (M)	METHOD OF SAMPLING	FREQ OF SAMPLING	LOCAL AUTHORITY	AUTHORISED SAMPLER(S)	LOCAL AUTHORITY LIAISON OFFICER
North Baleshare	Tràigh Leathann	UB 490 850 04	Common cockles	Wild	NF 7986 6315	79860	863150	100	N/A	Hand raked	Monthly	CnES	Samantha Muir	Samantha Muir

Comparative Table of Boundaries and RMPs – North Baleshare

Production Area	Species	SIN	Existing Boundary	Existing RMP	New Boundary	New RMP	Comments
North Baleshare	Common cockles	UB 490 850 04	N/A	N/A	Area bounded by lines drawn between NF 7697 6407 and NF 7702 6435 and between NF 7702 6435 and NF 7700 6526 and between NF 7700 6526 and NF 7833 6526 and between NF 7980 6426 and NF 7980 6385 and extending to MHWS	NF 7986 6315	New production area and RMP

Shoreline Survey Report

North Baleshare
UB 490

Restricted Sanitary Survey

Shoreline Survey Report

Production area:	North Baleshare
Site name:	Traigh Leathann
Species:	Common Cockles (*Cerastoderm edule*)
Harvester:	Duncan MacInnes
Local Authority:	CnES
Status:	New Site
Date Surveyed:	Wednesday 17th March 2010
Surveyed by:	Samantha Muir Matt MacDonald
Existing RMP:	NA
Area Surveyed:	See Figure 1.

Weather observations

Wednesday 17th March 2010	Overcast, very windy day. By end of day wind up too 40mph

Site Observations

Fishery

The North Baleshare production area is harvested for common cockles (*Cerostoderma edule*) within the Traigh Leathann site. The harvesters plan to harvest the cockles all year round, although harvesting will be weather dependent.

Sewage/Faecal Sources

The largest settlement at North Baleshare is the village Clachan na Luib, which was observed to have a shop (Clachan Stores), 8 houses, and a small primary school. Otherwise, only scattered dwellings are found around the production area. The main source of sewage pollution to the shellfish area is from the outfall from the large Bed and Breakfast, which at the time of the shoreline survey had *E. coli* levels of 46,000 cfu/100 ml.

Seasonal Population

There are no caravan parks or campsites in the area surrounding North Baleshare. One B&B, and two holiday homes were observed during the shoreline survey, which are likely to have a higher occupancy during the summer months June-September.

Boats/Shipping

No boats were seen on the sea during the shoreline survey. Two small boats were observed on the shore at Clachan na Luib.

Land Use

The area surrounding the fisheries is mainly croft land, primarily used for grazing sheep and some cattle.

Livestock
During the shoreline survey approximately 430 sheep and 50 cattle were seen grazing in crofts close to the shoreline of North Baleshare.

Wildlife/Birds
During the shoreline survey approximately 11 gulls, 29 oystercatchers and some waterfowl droppings were observed on and around the shoreline.

Observations can be found in Table 1.

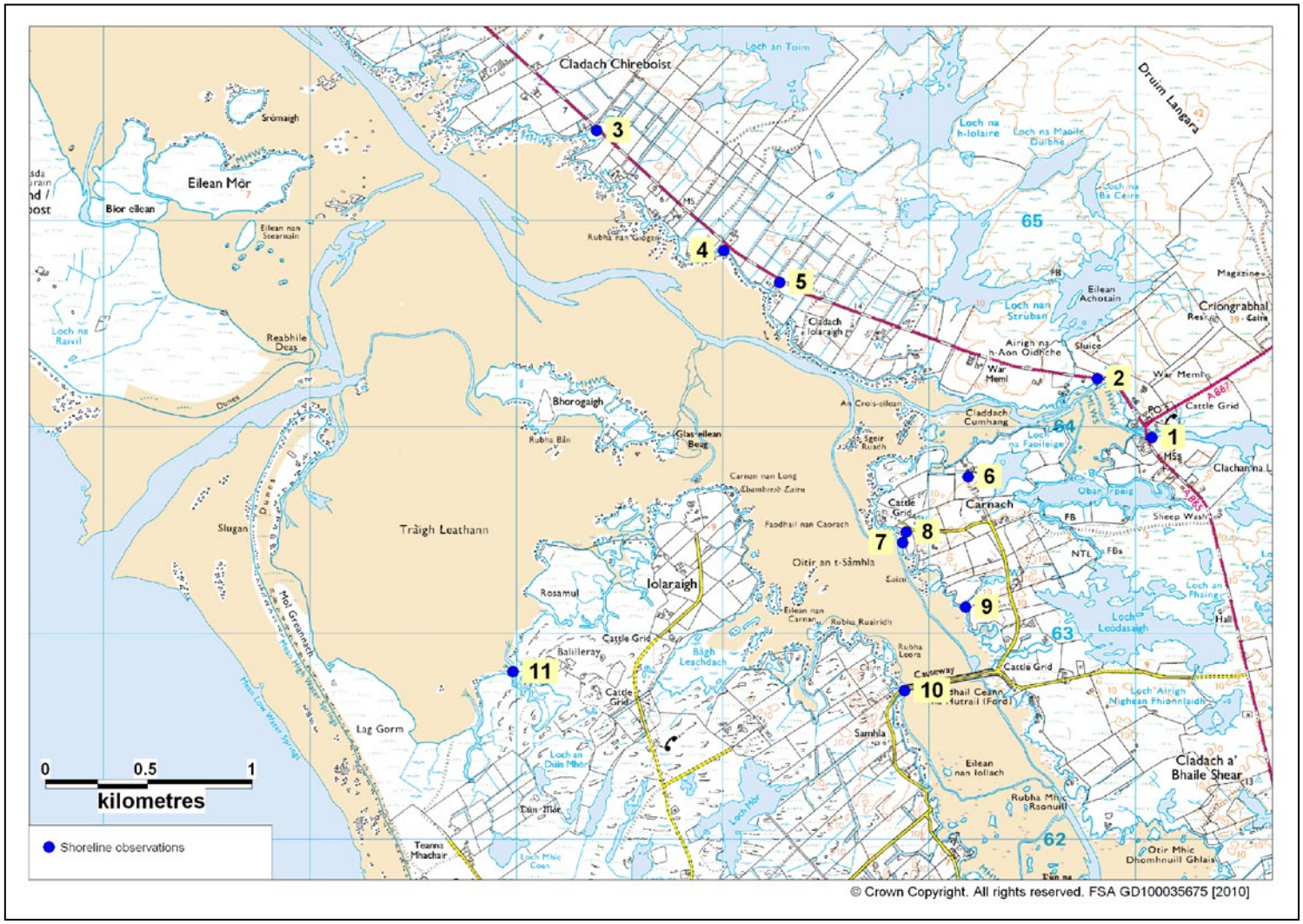


Figure 1. Shoreline Observations

Table 1. Shoreline observations

No.	Date	Time	NGR	East	North	Figure	Description
1	17/03/2010	08:55	NF 81080 63949	81080	863949	-	FW input at main road junction. Clachan Stores, 8 houses, 1 small primary school, 2 small boats, 2 gulls. Flow going up river even though tide was on the ebb? Width: 10m Depth: variable from 1m to 1.8m. Fresh water sample NBFW1.
2	17/03/2010	09:15	NF80816 64234	80816	864234	Figures 4 and 6	Hebridean Smokehouse on road next to shore. Tel: 01876 580209. Out flow out back of premises. Fresh water sample NBFW2. 60 sheep
3	17/03/2010	09:30	NF 78388 65439	78388	865439	Figure 7	Fresh water input, Width: 1.4m, depth: 32cm, Fresh water sample NBFW3, In view: 5 houses, 6 gulls, 4 oyster catchers, 29 sheep.
4	17/03/2010	09:45	NF 79007 64856	79007	864856	Figure 8	Septic outflow from large B&B, Fresh water sample NBFW4, In view: 6 houses, 12 sheep.
5	17/03/2010	09:50	NF 79276 64701	79276	864701	Figure 9	Minor run field off at building site, Fresh water sample NBFW5, In view: 5 houses, 2 holiday cottages, 25 sheep, 3 gulls, 7 geese.
6	17/03/2010	10:20	NF 80189 63759	80189	863759	-	In View: 4 houses, 54 sheep, 1 duck, + another 33 sheep.
7	17/03/2010	10:20	NF 79873 63439	79873	863439	-	NBSW1. All juvenile seed stock in this area. No commercial size cockles
8	17/03/2010		NF79889 63489	79889	863489	-	Minor field run off. In view: 25 oyster catchers, 17 sheep.
9	17/03/2010		NF 80177 63125	80177	863125	-	Fresh water run off from loch. Fresh water sample NBFW6. Width: 67cm, depth: 1cm, negligible flow.
10	17/03/2010	11:40	NF79880 62720	79880	862720	Figure 5	Fresh water input large, width: 20m, depth: 20cm. Fresh water sample NBFW8. Farm at top of shore with approx 200 sheep, 50 cows. Evidence of waterfowl.
11	17/03/2010		NF 77984 62812	77984	862812	-	Fresh water input, Fresh water sample NBFW7

Photos referenced in the table can be found attached as Figures 4 – 9.

Sampling

Water and shellfish samples were collected at sites marked on the map. Bacteriology results follow in Tables 2 and 3.

Samples were also tested for chloride by the laboratory. The results were reported as milligrams of chloride per litre. These were then converted to salinity expressed in parts per thousand (ppt) and are shown as such in Table 2.

Table 2. Water sample results

No.	Date	Sample	Grid Ref	Type	*E. coli* (cfu 100 ml^{-1})	Salinity (ppt)
1	18/03/2010	NBSW1	NF 79873 63439	Sea water	3	35.6
2	18/03/2010	NBSW2	NF 79674 63339	Sea water	25	31.3
3	18/03/2010	NBFW1	NF 81080 63949	Fresh water	200	-
4	18/03/2010	NBFW2	NF80816 64234	Fresh water	<100	-
5	18/03/2010	NBFW3	NF 78388 65439	Fresh water	<100	-
6	18/03/2010	NBFW4	NF 79007 64856	Fresh water	46000	-
7	18/03/2010	NBFW5	NF 79276 64701	Fresh water	<100	-
8	18/03/2010	NBFW6	NF 80177 63125	Fresh water	<100	-
9	18/03/2010	NBFW7	NF 77984 62812	Fresh water	<100	-
10	18/03/2010	NBFW8	NF 79880 62720	Fresh water	<100	-

Table 3. Shellfish sample results

No.	Date	Sample	Grid Ref	Type	*E. coli* (MPN/100 g)
1	17/03/2010	NBC1	NF 79674 63339	Common cockles	270
2	17/03/2010	NBC2	NF 7985 6289	Common cockles	490

Figure 2. Water sample results

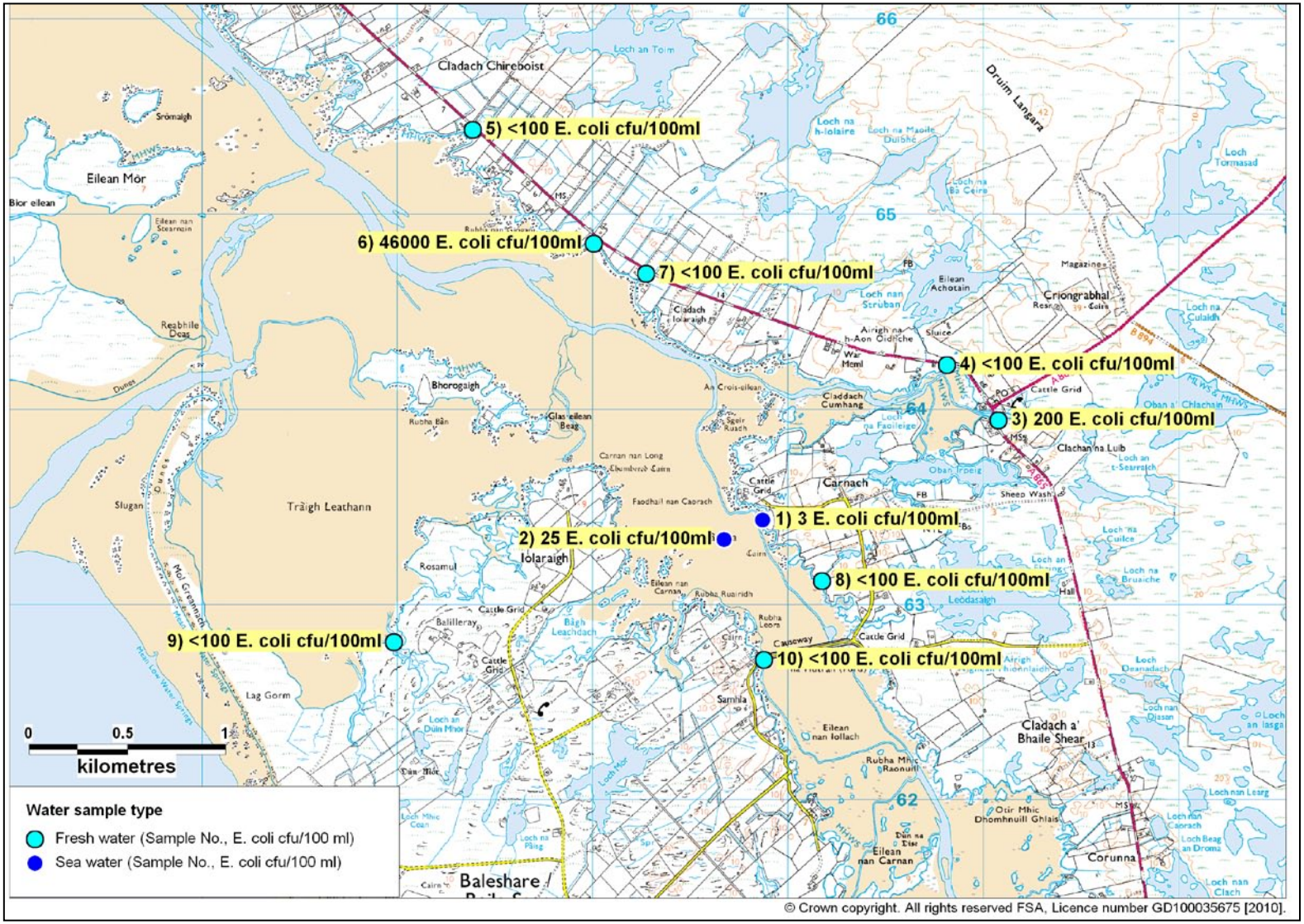
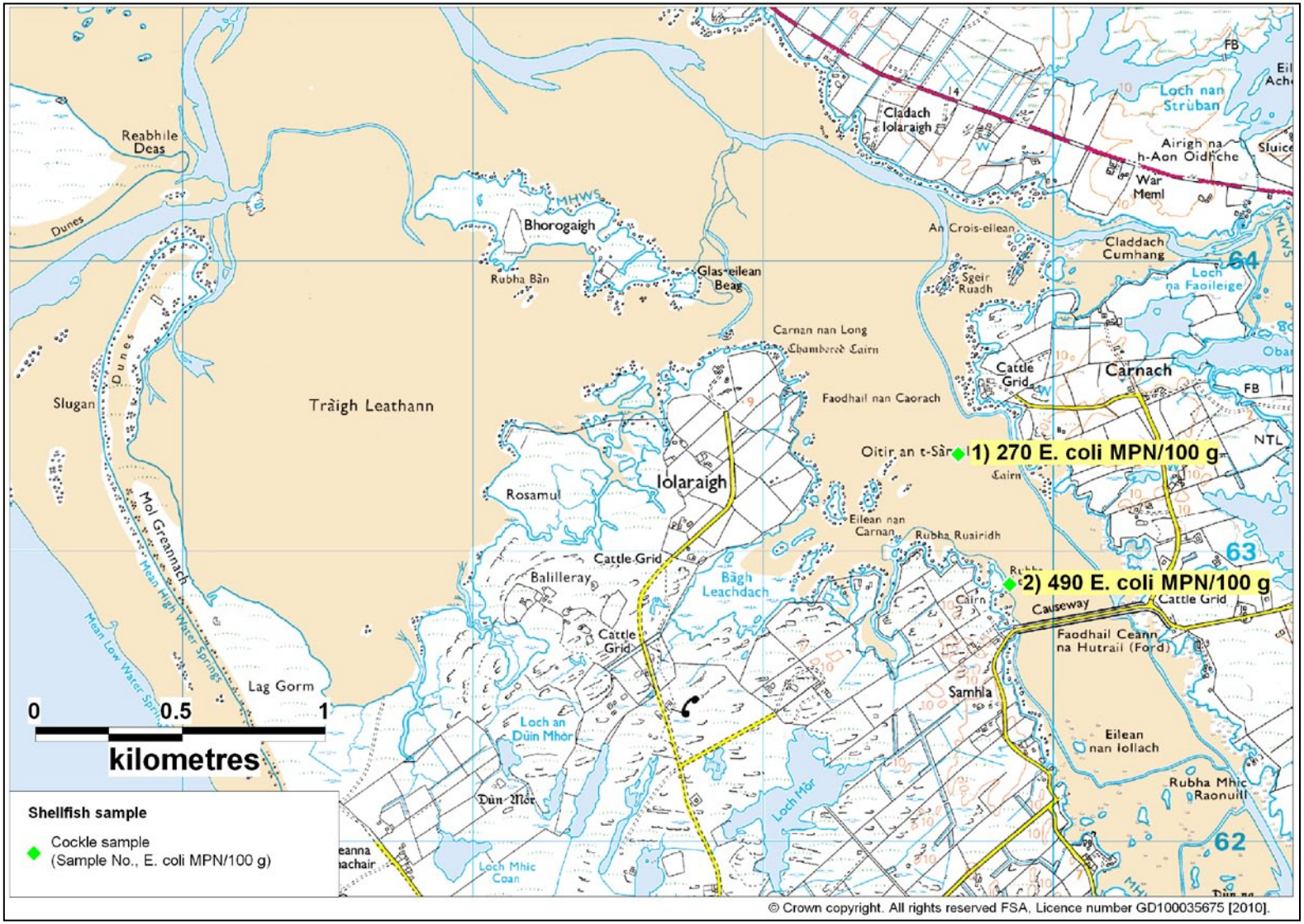


Figure 3. Shellfish sample results



Photographs

Figure 4 Hebridean Smokehouse on road next to shore.

Figure 5 Evidence of waterfowl

Figure 6 Outflow pipe at back of Hebridean Smokehouse. Water sample NBFW2
Figure 7 Fresh water input, water sample NBFW3

Figure 8 Septic outflow from large B&B, Fresh water sample NBFW4
Figure 9 Minor run field off at building site, Fresh water sample NBFW5

Appendix 4 – SEPA Discharge Consents – Soakaways

CLOSE SOAKAWAYS (WITHIN 400 M OF MHWS)			
Consent No.	**NGR of discharge**	**Discharge Type**	**Discharges to**
CAR/R/1045973	NF 79220 61330	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1046260	NF 79320 61270	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1068609	NF 78949 62533	Continuous	STE to soakaway, Illeray, Isle of North Uist
CAR/R/1059908	NF 80116 61583	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1057710	NF 80129 61911	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1059499	NF 80138 61633	Continuous	STE to soakaway, Baleshare, Isle of North Uist
CAR/R/1061958	NF 78758 63063	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1059475	NF 80150 61600	Continuous	STE to Land, Isle of North Uist
CAR/R/1015772	NF 79790 62770	Continuous	STE to land
CAR/R/1059869	NF 80427 62707	Continuous	STE to Soakaway, Baleshare, Isle of North Uist
CAR/R/1051345	NF 80320 63090	Continuous	STE to Land, Isle of North Uist
CAR/R/1075670	NF 79769 63590	Continuous	STE to soakaway, North Uist
CAR/R/1060987	NF 80472 63054	Continuous	STE to Soakaway, Baleshare
CAR/R/1061916	NF 81480 61210	Continuous	STE to soakaway, Lochmaddy, Isle of North Uist
CAR/R/1050434	NF 81580 61520	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1057652	NF 79380 64440	Continuous	STE to soakaway, Claddach Illeray, Isle of North Uist
CAR/R/1062157	NF 79600 64460	Continuous	STE to Land, Isle of North Uist
CAR/R/1057647	NF 79364 64562	Continuous	STE to soakaway, Illerary, North Uist
CAR/R/1060007	NF 80180 64280	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1059028	NF 81732 61960	Continuous	STE to Land, Isle of North Uist
CAR/R/1062155	NF 79640 64530	Continuous	STE to Land, Claddach Illeray, Isle of North Uist
CAR/R/1062162	NF 80209 64335	Continuous	STE to Land, Lochmaddy, Isle of North Uist
CAR/R/1057655	NF 79440 64640	Continuous	STE to soakaway, Claddach Illeray, North Uist
CAR/R/1027153	NF 79204 64683	Continuous	STE to soakaway, 1 Claddach Illeray, Isle of North Uist
CAR/R/1056417	NF 81816 61926	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1059664	NF 79096 64772	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1077368	NF 81857 61045	Continuous	STE to soakaway, North Uist
CAR/R/1033355	NF 81861 60945	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1060990	NF 81929 61078	Continuous	STE to soakaway, Claddach Baleshare, Isle of North Uist
CAR/R/1023278	NF 80982 64152	Continuous	STE to soakaway, Clachan, Isle of North Uist
CAR/R/1059919	NF 78440 65210	Continuous	STE to soakaway, Kirkibost, Isle of North Uist

Consent No.	NGR of discharge	Discharge Type	Discharges to
CAR/R/1059896	NF 78770 65250	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1019896	NF 78580 65330	Continuous	STE to land, Isle of North Uist
CAR/R/1043275	NF 78140 65560	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1049015	NF 77880 65740	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1059777	NF 77470 66030	Continuous	STE to Soakaway, Isle Of North Uist
CAR/R/1047184	NF 76870 66360	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1049964	NF 76887 66375	Continuous	STE to soakaway, North Uist
CAR/R/1059611	NF 76806 66416	Continuous	STE To soakaway, Isle Of North Uist
CAR/R/1021743	NF 77000 66750	Continuous	STE to land, North Uist
CAR/R/1061474	NF 76774 66816	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1042788	NF 76410 67323	Continuous	STE to soakaway, Ard Heisgeir, Isle Of North Uist
CAR/R/1041422	NF 76430 67340	Continuous	STE to Land, Isle of North Uist
CAR/R/1060093	NF 75410 67290	Continuous	STE to land, Kyles
CAR/R/1049921	NF 75370 67290	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1056615	NF 76043 67691	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1075695	NF 75409 67372	Continuous	STE to soakaway, Bayhead, Isle of North Uist
CAR/R/1050669	NF 76020 67900	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1047580	NF 75942 67879	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1075658	NF 75996 67919	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1055320	NF 75073 67833	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1040532	NF 72720 68450	Continuous	STE to soakaway, Paiblesgarry, Isle of North Uist
CAR/R/1049537	NF 72560 68400	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1060114	NF 78970 61770	Continuous	STE to land, Isle of North Uist
CAR/R/1060117	NF 79010 61770	Continuous	STE to Land, Isle of North Uist
CAR/R/1051023	NF 78960 61480	Continuous	STE to Soakaway, Isle Of North Uist
CAR/R/1048901	NF 79112 61365	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1048489	NF 78785 62208	Continuous	STE to soakaway, Baleshare
CAR/R/1056221	NF 78680 62460	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1056396	NF 80240 63550	Continuous	STE to soakaway, Balshore
CAR/R/1061479	NF 81619 62206	Continuous	STE to Soakaway, Claddach Baleshare
CAR/R/1052984	NF 81530 62580	Continuous	STE to soakaway, Claddach, Baleshare, Isle of North Uist
CAR/R/1059902	NF 81750 62100	Continuous	STE to soakaway, Bacesaale, North Uist
CAR/R/1064773	NF 81819 62118	Continuous	STE to Soakaway, Baleshare, Isle of North Uist

Consent No.	NGR of discharge	Discharge Type	Discharges to
CAR/R/1049545	NF 81850 61900	Continuous	STE to soakaway, North Uist
CAR/R/1048628	NF 81888 61479	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1059907	NF 81904 61694	Continuous	STE to soakaway, Baceshare, North Uist
CAR/R/1042880	NF 81906 61690	Continuous	STE to soakaway, Claddach Baleshare, Isle Of North Uist
CAR/R/1056111	NF 81897 61315	Continuous	STE to soakaway, Carinish, North Uist
CAR/R/1059905	NF 77670 66050	Continuous	STE to soakaway, Kirkibost, Isle of North Uist
CAR/R/1047138	NF 77588 66046	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1015810	NF 77610 66080	Continuous	STE to land
CAR/R/1042886	NF 77580 66160	Continuous	STE to Land, Isle of North Uist
CAR/R/1049235	NF 77462 66202	Continuous	STE to soakaway, Claddach Kirkibost, Isle of Uist
CAR/R/1049512	NF 77490 66330	Continuous	STE to Soakaway, Isle of South Uist
CAR/R/1073741	NF 77393 66450	Continuous	STE to soakaway, Claddach Kyles
CAR/R/1078347	NF 77200 66740	Continuous	STE to soakaway, North Uist
CAR/R/1060066	NF 77010 67440	Continuous	STE to land, Kyles
CAR/R/1070972	NF 74520 67650	Continuous	STE to soakaway, Bayhead, North Vist
CAR/R/1047486	NF 74450 67690	Continuous	STE to soakaway, Isle Of North Uist
CAR/R/1075664	NF 73787 67182	Continuous	STE to soakaway, Lochmaddy, Isle Of North Uist
CAR/R/1046824	NF 73760 67190	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1060035	NF 73700 67230	Continuous	STE to land, Isle of North Uist
CAR/R/1056779	NF 73720 67266	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1066791	NF 73701 67288	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1078014	NF 73574 67328	Continuous	STE to soakaway, North Uist
CAR/R/1012873	NF 73605 67414	Continuous	STE to land
CAR/R/1071021	NF 73550 67440	Continuous	STE to soakaway, Bayhead, Lochmaddy
CAR/R/1066622	NF 73436 67373	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1019199	NF 73290 67420	Continuous	STE to land, Isle of North Uist
CAR/R/1047213	NF 73310 67452	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1056146	NF 73483 67631	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1061525	NF 73394 67862	Continuous	STE to Land, Isle of North Uist
CAR/R/1061521	NF 73260 67861	Continuous	STE to Land, Isle of North Uist
CAR/R/1043007	NF 73974 68511	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1040534	NF 73220 67930	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1056464	NF 73180 67980	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1017127	NF 73140 67989	Continuous	STE to Land, 24 Knockintorran, Isle of North Uist

Consent No.	NGR of discharge	Discharge Type	Discharges to
CAR/R/1020661	NF 73730 68530	Continuous	STE to soakaway, North Uist
CAR/R/1059537	NF 73200 68180	Continuous	STE to Soakaway, North Uist
CAR/R/1075724	NF 72820 67890	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1075704	NF 73151 68245	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1080912	NF 73180 68300	Continuous	STE to soakaway, North Uist
CAR/R/1053853	NF 73825 68830	Continuous	STE to Soakaway, Knockintorran, Isle of North Uist
CAR/R/1056571	NF 73429 68704	Continuous	STE to Soakaway, Isle of North Uist
CAR/R/1076306	NF 73455 68867	Continuous	STE to soakaway, Isle of North Uist
CAR/R/1040533	NF 72980 68550	Continuous	STE to soakaway, Paiblesgarry, Isle of North Uist
CAR/R/1058555	NF 72950 68550	Continuous	STE to soakaway, Bayhead, Isle of North Uist
CAR/R/1059936	NF 72823 68583	Continuous	STE to soakaway, Isle of North Uist