A Deposit Return Scheme for Scotland Strategic Environmental Assessment





Scottish Government Riaghaltas na h-Alba gov.scot

Non-Technical Summary

Introduction

The Scottish Government's Programme for Scotland sets out the government's intention to implement a Deposit Return Scheme (DRS) for Scotland¹. The Scottish DRS is being introduced for single-use drinks containers. Zero Waste Scotland (ZWS) has responsibility for the development of the Outline Business Case for the DRS on behalf of the Scottish Government and has developed four example schemes to illustrate how DRS might be implemented in Scotland, with each differing dependent upon the materials collected or means of collection.

To help inform the Scottish Government's decisions in respect of DRS design, a Strategic Environmental Assessment (SEA) is being undertaken. The SEA is carried out to assess the likely significant environmental effects of the example schemes and to identify ways in which adverse effects can be avoided, minimised or mitigated. The SEA also explores how any positive effects can be enhanced. The findings are provided in this Environmental Report (ER). This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the SEA of the Scottish DRS.

This Environmental Report presents the findings of the SEA and is being published for consultation. The following sections of this NTS:

- provide an overview of the DRS for Scotland and the example schemes being considered;
- describe the SEA process together with how it is being applied to the DRS;
- describe the approach to undertaking the SEA of the DRS;
- summarise the findings of the SEA of the four example schemes; and
- present the conclusions and recommendations of the SEA.

What is the Deposit Return Scheme?

Deposit Return Schemes

Under a DRS, consumers pay a small deposit on select packaging types at point of sale, in addition to the purchase price of the product; this money is then refunded to them or whoever returns the empty package after use for recycling. In the case of drinks, the deposit is paid for the container, and consumers can then return the container to a designated collection point to recoup their deposit. The use of DRS usually relates to products and materials which are of potential value for reuse, recycling or recovery, or which, if mismanaged, may have detrimental effects on the environment.

Figure NTS 1 shows how materials are collected and returned within an example DRS. It also illustrates financial flows and highlights some of the main actors in such a scheme.

¹ The Scottish Government (2010) A Nation with Ambition – The Government's Programme for Scotland 2017- 18, Pg. 41 [online] Available at:

http://www.gov.scot/Resource/0052/00524214.pdf



Figure NTS 1 Example of a Deposit Return Scheme

The Deposit Return Scheme for Scotland

In September 2017, the Scottish Government announced that it will move to implement a DRS for Scotland on select single-use drink containers².

A DRS will support Scotland's resource efficiency and circular economy goals by increasing the quality and quantity of recycling for select single-use drink containers. In so doing, the DRS will contribute to the achievement of Scotland's existing waste policies and targets, and will also help to reduce single-use drinks container litter in Scotland's terrestrial and marine environments.

The DRS aims to deliver upon four key principles:

- Increase the quantity of target materials captured for recycling;
- Improve the quality of materials captured, to allow for higher value recycling;
- Encourage wider behaviour change around materials;
- Deliver maximum economic and societal benefits for Scotland.

http://www.gov.scot/Resource/0052/00524214.pdf

² The Scottish Government (2010) *A Nation with Ambition – The Government's Programme for Scotland 2017- 18*, Pg. 41 [online] Available at:

ZWS has developed four example schemes. The range of target materials vary across the example schemes but include: **polyethylene terephthalate (PET)** and **High-Density Polythene (HDPE) bottles**, **steel** and **aluminium cans**, **glass bottles**, **drink cartons** and **single use paper based cups**. The four example schemes developed by ZWS are summarised in **Table NTS 1**.

Example Schemes	Materials Collected	Means of Collection
Example 1: Take back to dedicated points	PET bottles, steel and aluminium cans, and glass bottles	This example scheme would see 1,058 deposit return points being placed in towns with a population of at least 1,000 to receive the returned containers. It is envisaged that the return process would be automated.
Example 2: Take back to dedicated points and some shops (with cartons and cups)	PET bottles, steel and aluminium cans, glass bottles, HDPE bottles, drink cartons and single- use paper based cups	This example scheme would have 2,009 return points, placed within a set distance of any shop selling drinks in containers, some of which would be expected to be in shops. It is envisaged that the return process would be automated.
Example 3: Take back to any place of purchase	PET bottles, steel and aluminium cans, and glass bottles	This example scheme would require any retailer that sells drinks in disposable containers to act as a return location, providing a deposit return service for all DRS containers. There are some 17,407 retailers across Scotland. It is envisaged that there would be a combination of automatic and manual returns.
Example 4: Take back to any place of purchase (with cartons and cups)	PET bottles, steel and aluminium cans, glass bottles, HDPE bottles, drink cartons and single- use paper based cups	The means of collection for this example scheme would be similar to example 3, but would cover a wider range of materials.

Table NTS 2	Example	schemes	being	considered	in Scotland
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To support the development of the examples schemes, ZWS has had extensive ongoing discussions with industry, waste management companies, retailers and local government through stakeholder reference groups and workshops. In addition, separate studies and analyses have been completed which have included quantifying the effects of different example schemes on the quantity of target material collected and diverted from other waste management routes, the associated carbon emissions and the infrastructure required (and available) for the example schemes considered. However, **it should be noted that at this stage, a preferred scheme has not been identified; the selection of the preferred scheme will be informed by public consultation on the DRS and the findings of the SEA.**

Further information relating to the DRS for Scotland is contained in Section 2 of this Environmental Report.

What is Strategic Environmental Assessment?

Overview

SEA is a statutory requirement under the Environmental Assessment (Scotland) Act 2005.

It applies to the development of a plan, programme or strategy, and seeks to identify, describe and evaluate the likely significant effects on the environment of implementation and propose measures to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects.

ZWS has screened the DRS against the requirements of the Environmental Assessment (Scotland) Act 2005 and identified that, as it is likely to have significant environmental effects, SEA is required.

The SEA Process To-date

SEA comprises five key stages:

- Stage A: Scoping;
- Stage B: Develop and refine alternatives and assess effects;
- Stage C: Prepare Environmental Report;
- Stage D: Consult on the draft plan and Environmental Report;
- **Stage E:** Make the final decision on how or whether to proceed with the proposed activity, plan or strategy, informing the public about that decision and monitoring the effects of implementation.

The first stage of the SEA of the DRS for Scotland (**Stage A**) lead to the production of a Scoping Report³. This set out the proposed scope and approach to assessing the potential environmental effects. The SEA Scoping Report for the DRS was issued for consultation for a five-week period concluding on the 1^{st} May 2018.

The DRS has been subject to assessment using the amended approach to assessment (**Stage B**), confirmed following consultation on the Scoping Report. Following development of the four proposed example schemes, each example scheme was critically assessed to consider the impact of each on the environment. The findings of those assessments are presented in this SEA Environmental Report (**Stage C**).

The DRS is now being consulted on alongside the SEA Environmental Report (**Stage D**). The responses received and findings of the SEA will be taken into account in the selection and adoption of the final DRS. Upon adoption of the DRS, the Scottish Government will publish a Post Adoption Statement. This Statement will reflect on the findings of the SEA and the views expressed in the consultation, and outline how the issues raised have been considered in the finalisation of the scheme.

During the implementation of the DRS, the Scottish Government will monitor the implementation and environmental effects of the DRS (**Stage E**).

Further information relating to the SEA process is contained in Section 1.2 of the Environmental Report.

³ Zero Waste Scotland (2018). DRS SEA Screening and Scoping Report

How have the environmental effects of the Deposit Return Scheme been assessed?

Each example scheme has been assessed to identify, describe and evaluate (where possible) the likely significant environmental effects that could arise from its implementation. The effects of the four example schemes have been considered upon the following topics that have been scoped into the SEA following the scoping stage (**Stage A**): biodiversity, flora and fauna; climatic factors; material assets; and landscape and visual impacts.

The assessment has adopted a two-tier approach. The **primary tier** explores the potential for significant, primary, environmental effects within the SEA scoped in topic. The **secondary tier** explores the indirect or secondary effects associated with the adoption of the DRS.

To support the assessment, assessment questions have been developed. The assessment questions have been designed to ensure that the SEA focuses on the key environmental effects relevant to each scoped in topic areas in the context of wider policy objectives, and to explore the potential for indirect and secondary environmental effects. The questions used in the assessment of the example schemes are set out in **Table NTS 2**.

SEA Topic	Tier 1 Question	Tier 2 Question
Climatic Factors	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated outside of Scotland?
Material Assets	Will the DRS:a. Contribute towards achieving Scotland's waste targets?b. Increase the economic value and utility of affected materials?c. Reduce 'leakage' of material to landfill or energy recovery or as litter?	Does the DRS have the potential for additional direct or indirect impacts on Material Assets?
Landscape and Visual Impacts	Will the DRS reduce littering of material into terrestrial and marine environments?	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?
Biodiversity	 Will the DRS a. Protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites? b. Support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions? c. Help avoid pollution of the terrestrial. 	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?

Table NTS 3 DRS SEA Assessment questions

SEA Topic	Tier 1 Question	Tier 2 Question
	coastal and marine environments?	
Other topic areas		Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?

In addition, there could be a range of other associated impacts on topic areas such as soil, air, water and cultural heritage through the siting, construction and operation of the DRS facilities. These effects have been considered as part of the cumulative effects assessment.

A more detailed overview of the approach to the assessment of the DRS is set out in Section 3 of the Environmental Report.

What are the likely significant environmental effects of the Deposit Return Scheme?

Table NTS 3 presents a summary of the effects of the four example schemes against each SEA topic scoped into the assessment; commentary on the likely significant positive and negative effects identified is provided in the sections that follow.

Table NTS 4 Summary of effects

Example scheme	Material Assets	Climatic Factors	Landscape and Visual Impacts	Biodiversity
Example 1: Take back to dedicated points	+/?	+/?	++/?	++/?
Example 2: Take back to dedicated points and some shops (with cartons and cups)	÷	+/?	++/?	++/?
Example 3: Take back to any place of purchase	+	++/?	++	++/?
Example 4: Take back to any place of purchase (with cartons and cups)	++/?	++/?	++	++/?

The key to each assessment score is shown below.



	Significant	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	uncertain
NB: where more the category. Where the Where a box is color significant effect al where there is insuj	an one symbol is p e scores are both p oured but also cont though a professio fficient evidence fo	resented in a box ositive and negati ains a "?" this indi nal judgement is e r expert judgemen	it indicates that ive, the boxes ar icates uncertain expressed in the it to conclude ar	the SEA has found re deliberately not ty over whether th colour used. A cou n effect.	d more than one s coloured (i.e. 'no o ne effect could be o nclusion of uncerto	core for the overall effect'). 1 minor or 2 inty arises

A summary of all material and carbon impact savings from each example scheme and reasonable alternatives is consolidated in **Table NTS 4**.

	Business as Usual (2018-2043)	Take back to dedicated points 60% Capture Rate (2018-2043)		sinessTake back to dedicated pointsTake back to dedicated points and some shops (with cartons and cups)60% Capture Rate70% Capture Rate18-2043)(2018-2043)		Take back to any place of purchase 80% Capture Rate (2018-2043)			Take back to any place of purchase (with cartons and cups) 80% Capture Rate (2018-2043)				
	Recycle Rate	Net national recycling rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Net national recycling rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Net national recycling rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Net national recycling rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)
Glass Bottles	64%	84%	1,060	869	88%	1,239	1,015	91%	1,416	1,160	91%	1,416	1,160
Steel drinks cans	46%	77%	28	49	82%	32	58	87%	37	66	87%	37	66
Aluminium drinks Cans	48%	78%	126	1,263	83%	147	1476	88%	168	1,687	88%	168	1,688
PET Bottles	50%	79%	263	547	84%	308	641	88%	349	730	88%	352	733
HDPE Bottles	53%	53%	-	-	84%	139	289	53%	-	-	89%	158	330
Drink Cartons	38%	38%	-	-	80	82	53	38	-	-	86%	94	61
Single-use Paper Cups	1%	1%	-	-	67%	126	82	1%	-	-	77%	145	94
Total	58%	78%	1,474	2,729	86%	2,072	3,612	85%	1,970	3,644	90%	2,370	4,131

Table NTS 5 Summary of DRS benefits by each example (Tonnage of material & Carbon savings⁴)

The true national recycling rate for the materials targeted via a DRS will be higher than the system capture rate itself because some items not returned to DRS will continue to be returned to other recycling streams. This is reflected in **Table NTS4**. The scheme modelling undertaken assumes that target material is removed at the headline capture rate from both current recycling and current residual streams in all the example schemes. This assumption and therefore this table may overstate benefits if material is removed disproportionately from the recycling stream, and this risk is greater for schemes with lower capture rates, specifically "Take back to dedicated points" (example scheme 1) and "Take back to dedicated points and some shops" (example scheme 2), or materials with higher pre-existing recycling rates.

⁴ Carbon savings inclusive of avoided waste management emissions and avoided primary production emissions enabled through the use of recycled DRS materials

Example scheme 1: Take back to dedicated points

The "Take back to dedicated points" example scheme would be a DRS established by regulation but with no requirement on any type of business to participate as a return location.

No significant cumulative positive effects associated with this example scheme have been identified. The implementation of this example scheme would be expected to increase capture rates⁵ to 60% for targeted materials (although it could be higher), generating a cumulative positive effect on material assets. This example scheme is anticipated to yield a recycling rate⁶ of 78% (up from 58% in the BAU model. An increase in recycling would, in-turn, be expected to generate cumulative positive effects in respect of climatic factors, associated with the diversion of waste material from landfill and incineration (generating an estimated materials savings of 1,474kt and emissions savings of 2,729ktCO₂eq until 2043) and landscape and visual impacts and biodiversity, related to reduced littering. However, in light of the limited target materials (PET bottles) and the relatively small number of return points compared to other examples, this example scheme would offer a limited contribution to Scottish waste and environmental strategies. With specific regard to climatic factors, it should be noted there remains some uncertainty with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials) and there would also be emissions associated with travel by consumers to/from sites.

The "Take back to dedicated points" example scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas (although the limited range of materials could result in non-target materials remaining as litter). It is anticipated that litter could drop by 30-50% under this example scheme however data regarding marine litter is limited. **Overall, this example scheme has been assessed as having a cumulative significant positive effect on landscape and visual impacts**.

No cumulative significant negative effects have been identified during the assessment. As with all example schemes, this example scheme could require new infrastructure (such as return points, counting centres or storage/bulking sites) which could have a minor, localised adverse impact on landscape character and visual amenity during both construction and operation (depending on the location and scale of the facilities, the existing landscape character and the proximity of sensitive receptors).

Example scheme 2: Take back to dedicated points and some shops (with cartons and cups)

This example scheme would be established by regulation and would require retailers to ensure a return location (either a dedicated point or a retailer who will collect materials), within a set proximity of their premises or accept containers for return directly.

The "Take back to dedicated points and some shops (with cartons and cups)" example scheme would allow consumers to return a wider range of containers to more convenient return points (relative to example scheme 1), increasing both the material recovered and quality by segregating target materials from food wastes and other residual waste contaminants. This example scheme is anticipated to capture

⁵ Capture Rates: The percentage of materials that is anticipated to be obtained into the example systems ⁶ Recycling Rates: The percentage of overall national recycling rates of the target materials including those collected and recycled through other processes such as household recycling schemes.



70% of target material. **This example scheme is anticipated to yield an even higher recycling rate of 86%** (supporting the Scottish Government's waste strategies and targets; in consequence, it has been assessed as having an overall cumulative significant positive effect on material assets.

No further cumulative significant positive effects have been identified. The diversion of materials into this example scheme will support national reductions in GHG emissions; under a 70% capture rate assumed in this example scheme, it is estimated 2,072kt of material will be diverted from landfill and incineration with associated emissions savings of 3,612ktCO₂eq until 2043. This has been assessed as having a cumulative positive effect on climatic factors, although some uncertainty remains with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials) and there would also be emissions associated with travel by consumers to/from return points.

As with the "Take back to dedicated points" example scheme, this example scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. This has been assessed as having a cumulative positive effect on landscape and visual impacts. A reduction in litter may also generate cumulative positive effects on biodiversity, particularly in respect of those sites protected for their importance to wild birds and marine habitats which are particularly vulnerable to the effects of litter.

No significant negative effects have been identified during the assessment.

Example scheme 3: Take to any place of purchase

The "Take to any place of purchase" example scheme would be a DRS established by regulation where individual retailers would be required to act as a return location.

Relative to those example schemes involving a return to dedicated points, the "Take to any place of purchase" example would increase accessibility to collection points significantly, providing a convenient scheme for consumers to redeem their deposit value and thereby encourage its widespread use. In this context, this example scheme is expected to capture 80% of target material. **This example scheme is anticipated to yield an even higher recycling rate of 85%,** which offers a strong opportunity to contribute toward Scottish waste and environmental objectives. Overall, the example scheme has therefore been assessed as having a cumulative significant positive effect on material assets; however, it should be noted that this scheme would target PET bottles only, limiting its potential to increase overall recycling rates for plastics in Scotland.

The "Take to any place of purchase" example scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas (although the limited range of materials could result in non-target materials remaining as litter). Further, under this example scheme, the return facilities would be located within existing retail premises such that any associated adverse effects on local landscape character or visual amenity are likely to be negligible. **Overall, this example scheme has been assessed as having a cumulative significant positive effect on landscape and visual impacts**.

A reduction in litter associated with **this example scheme may generate cumulative significant positive effects on biodiversity**, particularly in respect of those sites protected for their importance to wild birds and marine habitats which are particularly vulnerable to the effects of litter. No further cumulative significant positive effects have been identified. This example scheme will contribute to a reduction in GHG emissions; under the 80% rate assumed in this scheme, it is estimated 1,970kt of material will be diverted from landfill and incineration with associated emissions savings of 3,644ktCO₂eq until 2043. A "Take to any place of purchase" example scheme would be expected to generate some limited emissions savings given the increased accessibility of deposit locations (relative to example schemes 1 and 2) which may reduce the need for consumers to travel; however, the example scheme may also be associated with an increase in collection vehicle movements given the wider network of return sites. Overall, this has been assessed as having a cumulative positive effect on climatic factors, although some uncertainty remains with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials).

No cumulative significant positive or negative effects have been identified during the assessment of the "Take back to any place of purchase" example scheme.

Example scheme 4: Take back to any place of purchase (with cartons and cups)

This example scheme would be a DRS established by regulation on a take back to any place of purchase basis, where individual retailers would be required to act as a return location for any type of container.

Like the "Take back to any place of purchase" example scheme above (example scheme 3), this enhanced example scheme would increase accessibility to collection points, providing a convenient opportunity for consumers to redeem their deposit value and thereby encouraging use; such a scheme is anticipated to capture 80% of target material (although it could be higher). **This example scheme is anticipated to yield a recycling rate of 90%**. This example scheme would additionally allow consumers to return a wider range of containers to more convenient return points (relative to the "Take to any place of purchase" example scheme), increasing the material recovered and quality by segregating target materials from food wastes and other residual waste contaminants and supporting the Scottish Government's waste strategies and targets. **Overall, this example scheme is expected to deliver the greatest benefit in terms of increased recycling of the four example schemes considered in this report and has been assessed as having a cumulative significant positive effect on material assets.**

As with the "Take to any place of purchase" example scheme (example 3), this scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. Benefits in this regard are likely to be enhanced under this example scheme given the wider range of target materials (relative to the standard scheme). Under this example scheme, return facilities would be located within existing retail premises such that any associated adverse effects on local landscape character or visual amenity are likely to be negligible. **Overall, this example scheme has been assessed as having a cumulative significant positive effect on landscape and visual impacts.**

This example scheme will support the protection of designated nature conservation sites and terrestrial, coastal and marine ecosystems by incentivising a reduction in litter. The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation and in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. **Taking into account the range and expected volume of materials collected under this example scheme, the anticipated recycling rate and accessibility of return locations, a cumulative significant positive effect has been identified in respect of biodiversity.**

No further cumulative significant positive effects have been identified. The diversion of materials into the example scheme will support national reductions in GHG emissions; under an 80% capture rate assumed in this scheme, it is estimated 2,370kt of material will be diverted from landfill and incineration with associated emissions savings of 4,131ktCO₂eq until 2043. **This represents the largest GHG emissions saving of the four example schemes** considered in this report and reflects the range of materials collected and the anticipated recycling rate. Like the "Take to any place of purchase" example scheme, this example scheme would also be expected to generate some limited emissions savings given the increased accessibility of return locations (relative to the "Take back to dedicated points" example schemes 1 and 2), although as for example scheme 3, there may also be an increase in collection vehicle movements given the wider network of return sites and the increased materials collected. Overall, this example scheme has been assessed as having a cumulative positive effect on climatic factors, although there continues to be some uncertainty with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials).

No cumulative significant negative or negative effects have been identified during the assessment of the Take back to any place of purchase (with cartons and cups) scheme.

Other Environmental Effects

The assessment presented in the Environmental Report has demonstrated that **effects associated with the four example schemes on, soil, air, water and cultural heritage are unlikely to be significant**. This principally reflects the nature and scale of development associated with a DRS and that facilities are likely to be located within, or in close proximity to, existing waste management facilities or retail premises.

The detailed assessment of the example schemes, including cumulative effects, is contained in Sections 4 to 8 of the Environmental Report.

How can potential environmental effects be effectively managed, mitigated or enhanced?

The assessment of the four example schemes presented in the Environmental Report has identified opportunities to mitigate potential negative effects and enhance positive effects associated with their implementation. Proposed mitigation efforts of relevance to all example schemes are summarised below.

Environmental Effect	Proposed mitigation effort
Effects upon landscape through any construction of DRS related infrastructure – counting centre etc.	Existing infrastructure should be utilised to minimise the need for constructing new facilities.
Effects upon landscape through any construction of DRS related infrastructure – counting centre etc.	 If new facilities are required, consideration will need to be given to Location (and where not close to rural and isolated communities) how these communities will be served;
	• For facilities to be located in urban areas, seek to locate the facilities on sites with:

Table NTS 6 Mitigation of environmental effects

Environmental Effect	Proposed mitigation effort
	 Compatible adjacent land uses;
	 Previously developed land;
	 Good accessible locations, providing easy access throughout the day and at weekends;
	 No evidence of poor air quality;
	 No environmental constraints (such as being an area of high flood risk, or designated assets or features (such as wildlife sites, cultural heritage sites, listed buildings or water bodies)).
	Design of the infrastructure, seeking to maximise the use of recycled materials.
Effects (including greenhouse gas emissions) from the potential for increased vehicles movements from consumers, retailers and reprocessors	Dedicated take back points and/or counting centres should be carefully located to minimise vehicle movements both within built up areas and to minimise carbon emissions in operating the DRS. Integration or co-operation between retail supply chains and resource management supply chains would seem beneficial. Take back points should seek to utilise retail distribution centres that are closely aligned with recycling transfer stations or logistics networks. Organisations should look to optimise and utilise existing logistics services, and recycling and waste management options, in light of changes as a result of, or interactions with the DRS. Retailers should explore the opportunity to utilise back-hauling or reverse logistics when taking collected materials to bulking centres or counting centres. This will help minimise the GHG emissions from operating this example scheme. Local authorities might see specific opportunities to optimise recycling and waste management frequencies and routes.
Increased carbon emissions from exporting any materials abroad for reprocessing leading to a loss of valuable materials for Scotland's reprocessors and manufacturers.	Further work should explore the existing capacity of reprocessors in Scotland to manage the materials targeted within this example scheme.

What monitoring is proposed?

Section 19 of the Environmental Assessment (Scotland) Act 2005 requires the Responsible Authority, being the Scottish Government, to monitor significant environmental effects of the implementation of the Plan. This will require development of a monitoring framework that will require consideration of the following:

- A proposed roadmap of actions to implement and manage the chosen example scheme.
- Clear indicators for progress including, for example, the number of collection points introduced and operational, collected tonnages of materials, contamination rates, carbon emissions, greenhouse gas emissions and litter monitoring.
- Recommendations on the setting of annual targets and annual monitoring and reporting of Scotland's overall greenhouse gas emission abatement is undertaken by the Committee on Climate Change.
- The Water Framework Directive requirements for monitoring of water quality by member states, and monitoring of Scotland's rivers, canals, freshwater lochs, estuaries and coastal and offshore waters is undertaken by SEPA and reported annually.
- Changes to national levels of biodiversity, with a focus on the status of valued and designated biodiversity features, for example, Special Areas of Conservation and Special Protected Areas.
- The request from SEPA (raised during scoping), that the monitoring framework "examines the potential for unintended consequences from a DRS e.g. potential for manufacturers/retailers to switch products which fall outside of the example scheme and which in themselves could lead to negative environmental effects including increases in greenhouse gas emissions from production or an increase in the manufacture of products which cannot be recycled".

Existing monitoring undertaken by the Scottish Government is likely to be complemented by monitoring for specific policies and proposals at the sectoral level. For example:

- The Energy in Scotland series reports on changes to Scotland's energy mix, which provides information on how energy is both generated and consumed.
- Growth in new woodland and forestry are routinely monitored, and performance is reported against annual planting targets.
- Scotland 's performance against the waste hierarchy is reported annually, and improvements in reducing landfill waste and increasing utilisation of waste are regularly monitored and reported.

It is also likely that as new policies and proposals are brought forward, further monitoring proposals may be developed to review progress of their implementation.

What were the conclusions and recommendations of the SEA?

This SEA Environmental Report describes four example schemes, aligned with the Outline Business Case (OBC), to help inform discussion around the impacts of different design choices, and provide a basis for assessing the environmental benefits of various components of scheme design. A Full Business Case (FBC) will be developed once the preferred option has been selected following the public consultation.

Following assessment of the example schemes, it is recommended that any chosen DRS exhibits the following characteristics:

- **Materials**: That the DRS accepts the widest possible range of materials in order to have the biggest impact towards meeting the Scottish Governments recycling targets whilst embedding a culture and paradigm of recycling;
- **Return Points**: That the DRS offer return to point of purchase points to maximise convenience to service users, maximise capture rates of materials and minimise the impacts of unnecessary travel;
- **Scheme Performance**: That the service be a truly national service allowing ease of participation in both urban and rural settings;
- Additional Benefits: That the DRS captured material is reprocessed *within* Scotland and not exported abroad for reprocessing with consequent increases in GHG emissions;
- **Consumer Information/ Contamination Prevention**: That a Scottish labelling scheme be implemented to prevent contamination by containers which have not originated in Scotland;
- **Infrastructure and Logistics**: That existing infrastructure is used to house bulking sites and counting centres to minimise the environmental impact of implementing a DRS.

It is also recommended that all proposed mitigation efforts be considered and implemented.

A monitoring framework to evaluate the impacts of the DRS should also be adopted.

How to comment?

Public views are now sought on the example schemes and this Environmental Report.

We would welcome your views on any aspect of this Environmental Report. We are particularly interested to receive your response to the following questions:

- 1. To what extent does the Environmental Report set out an accurate description of the current baseline and the business as usual scenario? (Please give details of additional relevant sources)
- 2. Do you think that the Environmental Report has correctly identified the likely significant effects of the example schemes? (If not, what other significant effects do you think we have missed, and why?)
- 3. Do you agree with the recommendations and proposals for mitigation and enhancement of the environmental effects set out in the Environmental Report? (If not, what do you think should be the key recommendations and why?)

- 4. Are you aware of any further information that will help to inform the findings of the assessment? (Please give details of additional relevant sources)
- 5. Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the example schemes? (If not, what measures do you propose?)

The consultation runs until Autumn 2018. Comments on the Draft Strategy and the Environmental Report can be submitted online on the Scottish Government website⁷. General queries about the Scottish DRS process can be submitted to Zero Waste Scotland.

Following the conclusion of the consultation period, the responses received on both the example schemes and this Environmental Report will be analysed and reported. Key messages from respondents, including those of the various stakeholder groups, will be highlighted and the findings of the analysis will be taken into account in the selection and adoption of the final DRS.

⁷ Scottish Government. (accessed June 2018) *Strategic Environmental Assessment Gateway*: Accessible at: <u>http://www.gov.scot/seag/publicsearch.aspx?_ga=2.108556683.801215196.1528901962-2095685640.1488878586</u>

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Appendix A Appendix B Scoping Consultation Responses SEA Compliance Checklist

1. Introduction

This section provides a brief outline of the Deposit Return Scheme and the requirements of the Environmental Assessment (Scotland) Act 2005. It then presents the objectives, purpose and content of this Environmental Report.

1.1 Deposit Return Scheme

The Scottish Government's *Programme for Scotland*, stated the government's intention to implement a Deposit Return Scheme (DRS) for Scotland on select single-use drink containers⁸.

A DRS is a scheme where consumers pay a small amount of money in addition to the purchase price at point of sale; this money is then returned to them if they choose to return the item after use for recycling. In the case of drinks, the deposit is paid for the container, and consumers can then return the container to a designated collection point to recoup their deposit. The use of DRS usually relates to products and materials which are of potential value for reuse, recycling or recovery, or which, if mismanaged, may have detrimental effects on the environment.

Zero Waste Scotland (ZWS) has been appointed by the Scottish Government to oversee development of the Outline Business Case (OBC) for the DRS.

The Scottish DRS is being introduced for single-use drinks containers. Four example schemes have been developed, analysed and will be presented to the public for consultation. The range of materials being considered vary across the example schemes and include: **PET** and **HDPE bottles**, **steel** and **aluminium cans**, **glass bottles**, **drink cartons** and **single-use paper based cups**.

Key facts of the Scottish DRS are shown in **Table 1.1**.

http://www.gov.scot/Resource/0052/00524214.pdf

⁸ The Scottish Government (2010) A Nation with Ambition – The Government's Programme for Scotland 2017- 18, Pg. 41 [online] Available at:

Table 1.1 Scottish DRS Key Facts

Responsible Authority	Scottish Government
Title of PPS	Deposit Return Scheme for Scotland (DRS)
What prompted the PPS?	In September 2017, the Scottish Government announced it would implement a DRS for single-use drinks containers to raise recycling quality and quantity and reduce the impacts of litter, thereby supporting Scotland's 2025 waste targets established in <i>Making Things Last: A Circular Economy for</i> <i>Scotland</i> .
Subject (e.g. transport)	Waste.
Period covered by PPS	2018 onwards.
Frequency of updates	A further update on scheme design will be provided post- consultation on the possible example scheme to be taken forward.
Area covered by PPS	Scotland-wide.
Purpose and/or objectives of PPS	A DRS will support Scotland's resource efficiency and circular economy goals by increasing the quality and quantity of recycling for select single-use drink containers. In so doing, the DRS will contribute to the achievement of Scotland's existing waste policies and targets, and will also help to reduce single- use drinks container litter in Scotland's terrestrial and marine environments.
PPS Contact	David Barnes Moray House, Forthside Way Stirling FK8 1QZ Phone: 01786 433 969 Email: <u>david.barnes@zerowastescotland.org.uk</u>
SEA Contact	Michael Lenaghan Moray House, Forthside Way Stirling FK8 1QZ Phone: 07712 328341 Email: <u>michael.lenaghan@zerowastescotland.org.uk</u>

Source: Zero Waste Scotland (2018) DRS SEA Screening and Scoping Report

1.2 Strategic Environmental Assessment

ZWS has screened DRS against the requirements of the Environmental Assessment (Scotland) Act 2005 and identified that, as it is likely to have significant environmental effects, a Strategic Environmental Assessment (SEA) is required.

SEA is an iterative process, which involves the following stages:

- Stage A: Determining and agreeing the scope and approach of the proposed assessment;
- **Stage B**: Completing an assessment of the likely effects on the environment of a proposed plan, programme or strategy, and any reasonable alternatives and where appropriate identify relevant mitigation and monitoring measures;
- **Stage C**: Recording the assessment of the likely significant effects in an Environmental Report;
- **Stage D**: Undertaking a public consultation exercise on the Environmental Report (to accompany the draft plan, programme or strategy); and
- **Stage E**: Making the final decision on how or whether to proceed with the proposed activity, plan or strategy taking into account the comments resulting from the consultation and the contents of the Environmental Report; informing the public about that decision and monitoring the effects of implementation.

Stage A and D involve consultation. Stage A involves consultation with the SEA statutory consultees (Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Scotland (HS)) for 5 weeks. Stage D involves consultation with the SEA statutory consultees and the public for an appropriate period defined by the plan author.

The first stage of SEA (**Stage A**) leads to the production of a Scoping Report. This sets out the proposed scope and approach to assessing the potential environmental effects. The SEA Scoping Report for the DRS was issued for consultation for a five-week period concluding on the 1^{st} May 2018. Three responses to the consultation were received, which resulted in amendments to the proposed scope and approach to assessment (a schedule of consultation responses to the Scoping Report is contained at **Appendix A**).

The DRS has been subject to assessment using the amended approach to assessment (**Stage B**). This has included an initial high-level review of the four example schemes as well as a more detailed assessment. The findings of the assessments are presented in this SEA Environmental Report (**Stage C**). The Environmental Report also includes proposals for monitoring the effects of the DRS.

The DRS is now being consulted on alongside the SEA Environmental Report (**Stage D**). Following consultation on the DRS, the Scottish Government will review and analyse the responses received on both the example schemes and this Environmental Report. Key messages from respondents, including those from the various stakeholder groups (including the Business Regulatory Impact Assessment⁹ and Equality Impact Assessment¹⁰), will be highlighted and the findings of the analysis taken into account in the selection and adoption of the final design of an implemented DRS. Upon adoption of the DRS, the Scottish Government will publish a Post Adoption Statement (PAS). This Statement will reflect on the

⁹ Zero Waste Scotland (2018) Business Regulatory Impact Assessment.

¹⁰ Zero Waste Scotland (2018) Equality Impact Assessment

findings of the SEA assessment and the views expressed in the consultation, and outline how the issues raised have been considered in the finalisation.

During the implementation of the DRS, the Scottish Government will monitor the implementation and environmental effects of the plan (**Stage E**).

1.3 Purpose of this Environmental Report

This Environmental Report contains the SEA findings for the four example schemes demonstrated in the public consultation and OBC.

The purposes of the SEA of the DRS and this Environmental Report are:

- to ensure that the likely significant environmental effects of each of the four example schemes are identified, characterised and assessed;
- to help identify appropriate measures to avoid, reduce or mitigate adverse effects and to enhance beneficial effects associated with the implementation of each of the four example schemes wherever possible;
- to provide a framework for monitoring the potential significant effects arising from the implementation of the DRS;
- to give the statutory consultees, stakeholders and the wider public the opportunity to review and comment upon the environmental effects that each of the four example schemes may have on them, their communities and their interests, and to encourage and support them to make responses and suggest improvements to the example schemes considered;
- to inform Scottish Government's decisions on the introduction of a DRS; and
- to demonstrate that the DRS has been developed in a manner consistent with the requirements of the SEA Act.

This report has been produced for inclusion within the public consultation stage (stage D). It identifies, describes and evaluates the likely significant environmental effects of implementing each of the four example schemes over a 25 year period (2018-2043) and identifies ways in which adverse effects can be avoided, managed or mitigated and how any positive effects can be enhanced. It has been undertaken in parallel with the development of the scheme examples to both inform their development and assess how the adoption of the proposals may impact on the environment, both positively and negatively. Economic impacts of the DRS are explored in the Business Regulatory Impact Assessment¹¹ (BRIA) and equality aspects are assessed in the Equality Impact Assessment¹².

1.4 Environmental Report Structure

The remainder of this Environmental Report is structured as follows:

• Section 2 provides information on the Deposit Return Scheme (DRS).

¹¹ Zero Waste Scotland (2018) Business Regulatory Impact Assessment

¹² Zero Waste Scotland (2018) Equality Impact Assessment (interim)

- Section 5 provides an assessment of the material asset effects of each example scheme.
- Section 4 provides an assessment of the climatic factor effects of each example scheme.
- Section 6 provides an assessment of landscape effects of each example scheme.
- Section 7 provides an assessment of the biodiversity effects of each example scheme.
- Section 8 provides an assessment of the cumulative effects of each example scheme.
- Section 9 provides conclusions to the assessment, the proposals for monitoring and the next steps.

The Non-Technical Summary precedes Section 1. Abbreviations are provided after Section 9.

2. Deposit Return Schemes

This section provides an overview of a Deposit Return Scheme (DRS). It outlines how a DRS works, the context for the Scottish Government decision to move towards implementation of the DRS and sets out the four example schemes demonstrated in the Public Consultation.

2.1 **Overview of Deposit Return Schemes**

A DRS is one in which the consumer pays a refundable deposit on the product (such as a single-use select drink container) at the point of sale. This deposit is then refunded to whomever returns the empty container to a participating location for recycling. The collection scheme for DRS materials operates with collectors generally paid a fee to collect materials in the scheme.

Under a DRS, the refundable deposit creates a financial incentive for consumers to return the target material (such as a PET drinks container) to participating locations for recycling. DRS can increase recycling rates for targeted materials, and consequently reduce the likelihood they will end up in the residual waste stream, or as litter in terrestrial or marine environments. Separate collection via DRS can also improve the quality, value and utility of affected material by reducing contamination and subsequent sorting requirements, thereby supporting a more circular economy.

DRS are common in many countries including Australia, Estonia, Germany, Iceland, the US and Canada. DRS can vary in terms of what materials they target, the value of deposits, and how materials are collected.

DRS can significantly increase recycling rates for target materials. For example, in 2016 in the UK, 64.7% of packaging waste was recycled, significantly lower than in the following states and countries where DRS have been implemented: 75% in Massachusetts, Vermont and Oregon; 80% in California, Maine and British Columbia; over 85% in Scandinavia; and the Baltic states and 90% in Germany¹³.

By increasing the quality and quantity of recycled materials, DRS help reduce demand for virgin resources, resulting in other environmental benefits including reducing greenhouse gas emissions, as well as air and water pollutants.

The DRS provides a high-profile opportunity to reduce litter on land and in marine environments.

¹³ Zero Waste Scotland (2018) Deposit Return Scheme Options Overview

Figure 2.1Error! Reference source not found. shows how materials are collected and returned within an example DRS. It also illustrates financial flows and highlights some of the main actors in such a scheme.





Source: Eunomia (2015) Investigating the Feasibility of a Deposit Refund Scheme in Scotland¹⁴.

A Scottish Deposit Return Scheme. 2.2

In September of 2017, the Scottish Government announced it will move to implement a DRS for Scotland on select single-use drink containers¹⁵.

The option to introduce a DRS is also mentioned in the Scottish Government's Circular Economy strategy - Making Things Last – A Circular Economy Strategy for Scotland (MTL)¹⁶ published in February 2016. A DRS

¹⁴ Eunomia (2018). Investigating the feasibility of a deposit return system in Scotland. [online}

http://www.eunomia.co.uk/investigating-the-feasibility-of-a-deposit-refund-system-in-scotland/ ¹⁵ The Scottish Government (2010) A Nation with Ambition – The Government's Programme for Scotland 2017- 18, Pg. 41 [online] Available at:

http://www.gov.scot/Resource/0052/00524214.pdf ¹⁶ The Scottish Government (2016) *Making Things Last – A Circular Economy Strategy for Scotland* [online] Available at: http://www.gov.scot/Resource/0049/00494471.pdf

would go beyond existing Scottish Government policy making further progress towards a resource efficient economy and society. A Scottish DRS will support the targets, ambitions and actions set out in:

- MTL,
- Scotland's Zero Waste Plan (ZWP)¹⁷ published in June 2010,
- Safeguarding Scotland's Resources: Blueprint for a more Resource Efficient and Circular Economy (SSR)¹⁸ published in October 2013,
- Towards a Litter Free Scotland: A strategic Approach to Higher Quality Local Environments¹⁹ (TLFS) published in June 2014,
- A Marine Litter Strategy for Scotland²⁰ (MLSS) published September 2014.

A DRS will also help to address important public policy issues which have emerged since the publication of MTL. In particular there is growing global concern about the quantity and environmental impacts of plastic pollution, particularly in marine ecosystems. Plastics which are not collected for recycling or other waste management can 'leak' into the natural environment where they degrade over time and may be digested by wildlife, affecting animal, and ultimately human, health. The United Nations has acknowledged DRS as an effective approach to reducing plastic pollution in its Draft Resolutions on Marine litter and microplastics (2017)²¹, and Management of Marine Debris (2014)²².

Any DRS for Scotland must meet Scotland's specific needs - notably the challenge posed in providing a universal service to urban and rural areas; acknowledged and discussed further in the BRIA²³. It must also consider the relationship between consumers, retailers, drink producers, waste manufacturers and legislative bodies to ensure and sustain participation.

Scotland has committed to introduce a DRS for single-use drinks containers.

The DRS aims to deliver upon four key principles:

- Increase the quantity of target materials captured for recycling;
- Improve the quality of materials captured, to allow for higher value recycling;
- Encourage wider behaviour change around materials;

http://www.cms.int/sites/default/files/document/cop11 crp14 dr management marine debris 0.pdf 23 Zero Waste Scotland (2018) DRS partial BRIA

June 2018

¹⁷ The Scottish Government (2010) Scotland's Zero Waste Plan [online] Available at:

http://www.gov.scot/Publications/2010/06/08092645/0 (12/05/2015)
 ¹⁸ The Scottish Government (2012) Safeguarding Scotland's Resources - A Programme for the Efficient Use of Our Materials [online] Available at:

http://www.gov.scot/Publications/2012/06/4215

The Scottish Government (2014) Towards a Litter Free Scotland: A strategic Approach to Higher Quality Local Environments [online] Available at:

http://www.gov.scot/Resource/0045/00452542.pdf

²⁰ The Scottish government (2014) A Marine Litter Strategy for Scotland [online] Available at:

http://www.gov.scot/Publications/2014/09/4891/downloads 21 The United Nations Environment Programme (December 5, 2017) *Draft resolution on marine litter and microplastics* [online] Available at:

https://papersmart.unon.org/resolution/uploads/k1709154.docx

²² The United Nations Environment Programme (November 7, 2014) *Draft resolution on Management of Marine Debris* [online] Available at:

• Deliver maximum economic and societal benefits for Scotland.

Zero Waste Scotland (ZWS) has responsibility for the development of the OBC for example schemes on behalf of the Scottish Government (the Responsible Authority). ZWS have developed four example schemes with differing aspects for consideration, including: materials targeted, means of consumers to return materials and differing governance of any DRS. The range of materials being considered vary across the example schemes and include: **PET** and **HDPE bottles**, **steel** and **aluminium cans**, **glass bottles**, **drink cartons** and **single-use paper based cups**.

To support the development of the examples schemes, ZWS has had extensive ongoing discussions with industry, waste management companies, retailers and local government through stakeholder reference groups and workshops. In addition, separate studies and analyses have been completed which have included quantifying the effects of different example schemes on the quantity of target material collected and diverted from other waste management routes, the associated carbon emissions and the infrastructure required (and available) for the example schemes considered.

At this stage there is no preferred example scheme. All example schemes are discussed in the following section and are taken forward for assessment within this SEA.

2.3 Example Schemes and Reasonable Alternatives

In each of the four example schemes considered, **target materials** are collected via *either* dedicated points, dedicated points and some shops or any place of purchase. Dedicated points will include a range of facilities strategically located so that consumers can return their target items and reclaim their deposits. This will include use of **Reverse Vending Machines (RVMs)** located in recycling centres or public carparks. Retailers will collect materials direct from consumers via either **RVMs** or in large bags where space does not permit an RVM on site. These bags will then go to **Counting Centres** where they will be separated and sorted. The four example schemes are summarised in **Table 2.1**²⁴.

Table 2.1	Example	schemes	being	considered	in	Scotland

Example 1: Take back to dedicated points		
Materials	PET bottles, steel and aluminium cans, and glass bottles	
Anticipated capture rate	60%	

Example 1 involves containers being taken back to a number of large, dedicated locations, rather than there being lots of smaller return points in shops and public places.

What this example would look like

This scheme would see 1,058 deposit return points being placed in towns with a population of at least 1,000 where you can return some types of plastic bottles, aluminium and steel cans and glass bottles to get back the deposit you were charged for the container when you bought it. In this example we have assumed the type of plastic bottles would be ones made of a plastic called PET, which is the most common kind for fizzy drinks and bottled water, and also the most commonly

²⁴ Zero Waste Scotland (2018). *Deposit Return Scheme – Options Overview*

captured by DRS internationally.

The place where you return things would be similar to a recycling point, where the deposit return machines are placed in a range of public locations such as recycling centres or public car parks.

Under this example, shops selling drinks in containers wouldn't have to take the containers back. There would simply be a few drop off points in most towns where you could choose to return your drinks containers.

Who would run it

In this example, it is assumed that the drinks industry would work together to create a not for profit organisation that would run the DRS. This organisation would make sure the scheme runs properly, and some of the money made by the deposit scheme would pay for staff needed to run the scheme and the costs involved in running it.

The new organisation would need to run the network of designated drop-off points, collect in the deposit money from producers, refund the deposits when containers are returned, and make sure all the containers were collected for recycling.

The effectiveness of these types of schemes elsewhere in the world

Schemes like this in North America and Australia tend to see around 60% of drinks containers being recycled and this is the return rate modelled in this example.

The benefits and drawbacks of the example

While this offers the lowest return rate of the four examples, it minimises impact on retailers and other businesses.

There are drawbacks to this approach. If the designated return points are not located in major shopping areas or are otherwise central, people could find themselves making a special trip to return their containers rather than doing it as part of their normal shopping pattern. This reduces the accessibility of the scheme, particularly for disabled or elderly people. If the return point is away from a town or city centre, it would also be inaccessible for people without cars and could also lead to increased emissions if people have to drive to it.

This is particularly true for rural areas, as people could find their nearest return point is in a town that is hard for them to get to, particularly if they are transporting a large number of returnable containers. Not being able to access a return point for long periods, if it is hard to reach, will also mean they will have to store a large number of containers at home.

This example has been modelled with a 20p deposit level which reflects the need for a sufficient deposit rate to achieve a reasonable return rate and compensate for the lower accessibility of the scheme.

Limited access to the return points might also mean that if someone buys a drink from a retailer and consumes it 'on the go', the container would be more likely to be improperly disposed of – i.e. thrown in a bin or littered.

The estimated likely return rate for containers in this example is 60%, which is only a marginal



improvement on current assumed recycling for these materials. It is therefore questionable whether introducing a deposit return scheme on this basis would be justified as it will not achieve Scotland's ambitions on recycling rates.

The modelling suggests that this example scheme would generate a financial surplus given the large number of unreturned deposits.

Example 2: Take back to dedicated points and some shops (with cartons and cups)		
Materials	PET bottles, steel and aluminium cans, glass bottles, HDPE bottles, drink cartons and single-use paper based cups	
Anticipated capture rate	70%	

Example 2 is a similar scheme to Example 1 but it would have 2,009 return points, as some shops may also have to have deposit return points where there isn't a recycling point style dedicated drop off nearby. It would also collect a wider range of container materials in addition to those in Example 1; HDPE, which is the kind of plastic that milk bottles are made of, cartons and disposable cups.

What this example looks like

This scheme would see deposit return machines being placed within a set distance of any shop selling drinks in containers, so that there would be somewhere nearby that people could return the containers to get back the deposit they paid when they bought it.

It would cover more types of plastic bottles than Example 1, as well as aluminium and steel cans, drinks cartons, glass bottles and some single use cups like coffee cups. This example would cover PET plastic, which is the kind that fizzy drinks and bottled water are usually made of, and also a type of plastic called HDPE which is the kind that milk bottles are usually made of.

In this example, shops that sell a high amount drinks in disposable containers would need to make sure there was a place to get the deposit back within a set distance. If there wasn't a public recycling point style dedicated point within that distance, then the shop would have to have a way to return your deposit to you in the store.

Who would run it

In this example, it is assumed that drinks companies and retailers would work together to create a not for profit organisation that would run the deposit return scheme. This organisation would make sure the scheme runs properly, and some of the money collected by the deposit scheme would pay for staff needed to run the scheme and the costs involved in running it. The difference in Example 2 is that shops would also have a part to play in making sure there is somewhere to get your deposit back nearby.

The new organisation would need to run the network of designated drop-off points, collect in the deposit money, refund the deposits when containers are returned, pay retailers a handling fee and reimburse deposits they have refunded as appropriate and make sure all the containers were collected for recycling.

The effectiveness of these types of schemes elsewhere in the world

Schemes like this in California, Maine and British Columbia can see around 80% of drinks containers being recycled. Given Scotland's geography we assumed a slightly lower rate of return, 70%, than the optimal rates achieved elsewhere in the world.

The benefits and drawbacks of the example

This example offers a higher return rate for drinks containers than Example 1. It also limits the impact on retailers but not to the same extent as example 1 as some retailers may be required to provide return points, or take back in store, if there are no return designated drop-off points nearby.

It also goes some way towards solving the problem of accessibility as there would be a larger number of return points, potentially in more convenient locations. This could still limit access to the scheme for people in rural areas, if their local shops do not sell a high enough volume of drinks to warrant having take-back on their premises or close by.

As with example 1, this example has been modelled with a 20p deposit level which reflects the need for a sufficient deposit rate to achieve a reasonable return rate and to compensate for the lower accessibility of the scheme.

Example 3: Take back to any place of purchase	
Materials	PET bottles, steel and aluminium cans, and glass bottles
Anticipated capture rate	80%

Example 3 is an example where you would be able to take your drinks containers back to any retailer that sells drinks in disposable containers.

What this example looks like

This example would mean that any retailer that sells drinks in disposable containers would have to provide a deposit return service so you can get back the deposit you paid on the container when you bought the drink. You would be able to take your container back to any of these 17,407 retailers – it wouldn't have to be the same one you bought the drink from. It would mean there would be a lot more places where you could claim your deposit back in your local area, compared to Examples 1 and 2.

Bigger retailers may have machines to collect the bottles and cans, and return people's deposits. Smaller retailers with less space could return deposits over the counter, collecting the containers manually.

This example would cover some types of plastic bottles, aluminium and steel cans and glass bottles. We have assumed that the type of plastic bottles would be ones made of a plastic called PET, which is the most common kind for fizzy drinks and bottled water.

Who would run it

Similar to Examples 1 and 2, it is assumed that the drinks industry and retailers would work together to create a not for profit organisation that would run the deposit return scheme. This organisation would make sure the scheme runs properly, and some of the money made by the deposit scheme would pay for its staff and running costs. It would need to collect in the deposit money and arrange for handling fees and deposits to be reimbursed to return points to cover the cost of running these. It would also ensure containers are picked up from retailers regularly and recycled.

Retailers that sell drinks in disposable containers would have to provide a scheme in store to give people back the deposits on any drinks containers covered by the scheme (PET plastic, cans and glass bottles).

The effectiveness of these types of schemes elsewhere in the world

Schemes like this in Scandinavia and the Baltic states are seeing up to 95% of drinks containers being recycled. We have modelled a return rate of 80% for this example given the deposit level of 10p. It would be anticipated that a higher deposit level would increase the return rate.

The benefits and drawbacks of the example

This example offers the highest return rate for containers in scope. As it has the highest return rate for the target containers, it most closely matches the environmental ambitions of the policy of increasing the recycling rate and reducing littering.

It would have an impact on retailers, through either loss of selling space if they install a reverse vending machine or staff time if they take back manually over the counter, plus the requirement to store containers until they are collected. The scheme would offer a 'handling fee' paid per container returned to reimburse shops for the use of staff time and retail space.

A "Take back to any place of purchase" scheme would also be the most accessible. If every retailer either has a reverse vending machine or takes back over the counter, people will be able to return their containers as part of their normal purchasing routine. Even if customers chose to make a special trip to return their containers, the density of return points means it is likely they will not have to travel far to find one.

Example 4: Take back to any place of purchase (with cartons and cups)		
Materials	PET bottles, steel and aluminium cans, glass bottles, HDPE bottles, drink cartons and single-use paper based cups	
Anticipated capture rate	80%	

Example 4 is similar to Example 3, where you would be able to take your drinks containers back to any shop that sells drinks in disposable containers. The difference is that example 4 would collect a wider range of drinks containers and would be jointly run by a public body and the drinks/retail industry.

What this example looks like

This scheme is similar to example 3, and would mean that any shop that sells drinks in disposable drink containers would have to provide a deposit return service so you can get back the deposit you paid on the container when you bought the drink. You would be able to take your container back to any of these shops – it wouldn't have to be the same one you bought the drink from.

The difference with example 4 is that it would collect a wider range of drinks containers. It would collect PET plastic, which is the kind that fizzy drinks and bottled water are usually made of, and also a type of plastic called HDPE which is the kind that milk bottles are usually made of. It would also collect aluminium and steel cans, drinks cartons, glass bottles and some single use cups like coffee cups.

Who would run it

This example assumes that an organisation made up of a public body and leaders from the drinks and retail industries would be set up to run the scheme. This organisation would make sure the scheme runs properly, and some of the money made by the deposit scheme would pay for its staff and running costs. It would need to collect in the deposit money and arrange for handling fees and deposits to be reimbursed to return points to cover the cost of running these. It would also ensure containers are picked up from retailers regularly and recycled.

Shops that sell drinks in disposable containers would have to provide a scheme in store to give people back the deposits on any drinks containers covered by the scheme (PET and HDPE plastic, cans, drinks cartons, glass bottles and cups).

The effectiveness of these types of schemes elsewhere in the world

This would be a uniquely ambitious scheme for Scotland as nowhere else in the world collects this range of material via a deposit return scheme. Schemes in Scandinavia and the Baltic states are seeing up to 95% of drinks containers being recycled. We have modelled a return rate of 80% for this example given the deposit level of 10p. It would be anticipated that a higher deposit level would increase the return rate. This means the scheme would be collecting a much wider variety of materials at a high rate, offering the highest possible capture rates and litter reduction.

The benefits and drawbacks of the example

As noted above, this would not only achieve a high capture rate for the materials included in Example 3, it is likely it would also help tackle a range of other materials, increasing the rate of recycling and preventing them from becoming litter.

Some of these items are harder to recycle, however one of the main obstacles to these materials being recycled is that they are not available separately to other materials in sufficient amounts to make recycling them cost effective. This would be addressed in a deposit return scheme. However, greater attention would need to be devoted to ensuring sufficient recycling infrastructure was in place for items that are not currently widely recycled.

As with Example 3, this would also offer improved accessibility due to the high level of



return points in both rural and urban locations and the fact that these return points will be where people will be going to shop.

Source: Zero Waste Scotland (2018).

Each example scheme above has been assessed using the assessment methodology outlined in Section 3. The anticipated benefits of introducing each of the example schemes, in terms of increased recyclate tonnages and carbon savings, are summarised below in **Table 2.2**
	Business As Usual (2018-2043)	Take back to dedicated points (2018-2043)		points and some shops (with cartons and cups) (2018-2043)		Take back to any place of purchase (2018-2043)			Take back to any place of purchase (with cartons and cups) (2018-2043)				
	Recycle Rate	Recycle Rate ²⁶	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Recycle Rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Recycle Rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)	Recycle Rate	Increased recycling compared to BAU (kt)	Carbon savings relative to BAU (ktCO2eq)
Glass Bottles	64%	84%	1,060	869	88%	1,239	1,015	91%	1,416	1,160	91%	1,416	1,160
Steel drinks cans	46%	77%	28	49	82%	32	58	87%	37	66	87%	37	66
Aluminium drinks Cans	48%	78%	126	1,263	83%	147	1476	88%	168	1,687	88%	168	1,688
PET Bottles	50%	79%	261	547	84%	308	641	88%	349	730	88%	352	733
HDPE Bottles	53%	53%	-	-	84%	139	289	53%	-	-	89%	158	330
Drink Cartons	38%	38%	-	-	80	82	53	38	-	-	86%	94	61
Single-use Paper Cups	1%	1%	-	-	67%	126	82	1%	-	-	77%	145	94
Total	58%	78%	1,474	2,729	86%	2,072	3,612	85%	1,970	3,644	90%	2,370	4,131

Table 2.2 Summary of DRS benefits by each (Tonnage of material & Carbon savings²⁵)

²⁵ Carbon savings inclusive of carbon reductions associated with waste management of the containers in addition to the carbon savings associated with the increased recycling of the containers.

containers. ²⁶ The true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself because some items not returned to DRS will continue to be returned to other recycling streams. It should also be noted that modelling assumptions used to quantify materials and carbon may overstate the net recycling gain and associated carbon benefit for "Take back to dedicated points" (example scheme 1) and "Take back to dedicated points and some shops" (example scheme 2). Modelling confirms the likely scale of change; however, to avoid overstating effects, conservative estimates for recycling rates (based on comparable international examples) for each example scheme are used throughout this report.

3. The Approach to the Assessment

This section outlines the approach to the assessment. This section presents the scope of the assessment. The section then summarises the process undertaken to produce this SEA. A two-tier approach has been applied to ensure a comprehensive assessment of direct and indirect and secondary effects on the environment of each example scheme, each considered over a 25 year period (2018-2043).

3.1 Scope of the Assessment

3.1.1 Overview

The aim of the SEA is to identify, describe and evaluate the likely significant environmental effects of implementing each of four example schemes.

Schedule 3 of the Environmental Assessment (Scotland) Act 2005 require that the assessment includes information on the "likely significant effects on the environment, including on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues referred to".

Consideration has been given the relevant contextual information, together with the characteristics of the example schemes, to define the scope of the assessment.

3.1.2 Scoping Consultation

Consultation with the statutory consultees²⁷ was undertaken on the proposed scope of SEA for a 5-week period concluding 1st May 2018. Each consultee was provided with the DRS SEA Screening and Scoping Report²⁸; issued by ZWS and comments invited. Consultation responses were received from all three statutory consultees.

The consultees all welcomed the fact that the SEA was being undertaken, and provided comments on:

- the topics to be included in the assessment;
- the proposed sources of baseline information for the topics;
- suggested Plans, Programmes and Strategies to be included in the contextual information;
- the proposed approach to assessment;
- the potential to reference additional guidance when considering specific effects.

The full list of comments and response are provided as Appendix A.

3.1.3 Revised Scope

In **Table 3.1**, each of the 12 SEA topic areas is considered in turn, and provides a justification for whether each is scoped in, or scoped out, from this SEA. The rationale for scoping topics in, or out, is taken from both



²⁷ Section 3 of the Environmental Assessment (Scotland) Act 2005 defines the consultation authorities as Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Scotland (HS)

²⁸ Zero Waste Scotland (2018). DRS SEA Screening and Scoping Report

the ZWS DRS SEA Screening and Scoping Report²⁹ and also reflects the consultation responses to scoping from the statutory consultees (**Appendix A**).

Table 3.1 SEA topics considered for this SEA

SEA Topic	Scoped In (Y) or Scoped Out (N)	Justification			
		The key components and objectives of the DRS are aimed primarily at improving recycling quality and quantity for select single-use drink containers, and reducing litter of those materials in both terrestrial and marine environments.			
Biodiversity, Flora and Fauna	Y	In consequence, given the potential effects on terrestrial and marine ecosystems, statutory consultees requested that this topic be scoped into this SEA. Given the generic (i.e. non-site-specific) nature of the example schemes, consideration of site specific aspects of biodiversity, flora and fauna would be premature and commentary on effects is of an equivalent generic nature. Such constraints have been noted in the assessment.			
Population	Ν	This assessment is predicated on the assumption that DRS will result in behavioural change that will have positive effects recorded in other topics (increased recycling is described in material assets and reduced littering of affected materials is described in landscape). This is based on ample evidence from jurisdictions abroad where DRS is already in operation.			
		On the basis that these behavioural impacts are well- established and that the consequences are considered in other topics, population impacts have been scoped out of this assessment.			
Human Health	Ν	This assessment is predicated on the assumption that DRS will result in behavioural change that will have positive effects recorded in other topics (increased recycling is described in material assets and reduced littering of affected materials is described in landscape). This is based on ample evidence from jurisdictions abroad where DRS is already in operation.			
		On the basis that these behavioural impacts are well- established and that the consequences are considered in other topics; human health impacts have been scoped out of this assessment.			
Soil	Ν	The example schemes will use return facilities including RVMs, assumed to be located within existing facilities (such as Household Waste Recycling Centres, local bottle bank centres or existing retail centres). All example schemes could require new infrastructure (such as return points,			

²⁹ Zero Waste Scotland (2018). DRS SEA Screening and Scoping Report



SEA Topic	Scoped In (Y) or Scoped Out (N)	t Justification			
		counting centres or storage/bulking sites) which could be in existing urbanised environments, located on existing waste management premises or on previously developed land (which are unlikely to have significant effects on the soil resource). Given uncertainties on the facility footprint, number and location, any assessment of such considerations will be limited.			
		All example schemes will lead to an increase in collected target materials and a reduction in materials being handled through existing waste management collection options. Indirectly, and to a limited extent, this may then affect the demand for expansion of waste management facilities (such as landfill). The increased supply of high quality secondary materials could also lead to new or expanded industrial facilities to process the materials. Both may be associated with potential effects on soil quality.			
		In the context of the DRS and this SEA, any potential mitigation for these activities would require application at the point of planning for individual facilities. Potential environmental effects are currently addressed through existing regulatory processes such as the Pollution Prevention and Control (PPC) Regulations and Controlled Activity Regulations (CAR), as well as the planning application process. Further, a statutory requirement for environmental assessment (e.g. Environmental Impact Assessment (EIA), Habitats Regulations Appraisal (HRA)) for developments likely to have significant effects is also in place to facilitate the identification of potential environmental effects associated with these activities, and help to avoid and/or mitigate them. To ensure that the potential for these effects is recorded,			
		and to allow for the SEA findings to directly inform the consideration of relevant issues at the local and project levels, it is proposed that the SEA acknowledge the potential for secondary effects associated with this topic.			
Water	Ν	All example schemes will lead to an increase in collected target materials and a reduction in materials being handled through existing waste management collection options. The increased supply of high quality secondary materials could also lead to new or expanded industrial facilities to process the materials. To ensure such material is clean of contaminants before processing, they will be washed, requiring water, with the resulting waste water requiring treatment, prior to reuse.			
		Potential environmental effects are currently addressed			

SEA Topic	Scoped In (Y) or Scoped Out (N)	Justification
		through existing regulatory processes such as the Pollution Prevention and Control (PPC) Regulations and Controlled Activity Regulations (CAR), as well as the planning application process
		To ensure that the potential for these effects is recorded, and to allow for the SEA findings to directly inform the consideration of relevant issues at the local and project levels, it is proposed that the SEA acknowledge the potential for secondary effects associated with this topic.
		The example schemes may result in increased vehicle movements (from the delivery of any new return facilities, the construction of any collection centres, users visiting return sites and from collection companies carrying the materials to processing centres). There may be changes in emissions from the processing sites due to the increased volume of material being handled.
Air N	Ν	In the context of the DRS and this SEA, any potential mitigation for these activities would require application at the point of planning for individual facilities. Potential environmental effects are currently addressed through existing regulatory processes such as the Pollution Prevention and Control (PPC) Regulations and Controlled Activity Regulations (CAR), as well as the planning application process. Further, a statutory requirement for environmental assessment (e.g. EIA and HRA) for developments likely to have significant effects is also in place to facilitate the identification of potential environmental effects associated with these activities, and help to avoid and/or mitigate them.
		To ensure that the potential for these effects is recorded, and to allow for the SEA findings to directly inform the consideration of relevant issues at the local and project levels, it is proposed that the SEA acknowledge the potential for secondary effects associated with this topic.
		The key components and objectives of the DRS are aimed primarily at improving recycling quality and quantity for select single-use drink containers, and reducing litter of those materials in both terrestrial and marine environments.
Climatic Factors	Y	The recovery and recycling of collected materials in preference to the use of virgin materials will have significant effects on the embodied carbon associated with the lifecycle of the single-use containers. In consequence, climatic factors is scoped into this SEA.

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SEA Topic	Scoped In (Y) or Scoped Out (N)	Justification
Material Assets	Y	The key components and objectives of the DRS are aimed primarily at improving recycling quality and quantity for select single-use drink containers, and reducing litter of those materials in both terrestrial and marine environments. As such, the DRS is expected to have significant impacts related to material assets which is scoped into this SEA.
Cultural heritage and the historic environment	Ν	The example schemes will use return facilities including RVMs, assumed to be located within existing facilities (such as Household Waste Recycling Centres, local bottle bank centres or existing retail centres). All example schemes could require new infrastructure (such as counting centres or bulking sites) which could be in existing urbanised environments or located on existing waste management premises and whilst unlikely, there may be some potential to affect cultural heritage and the historic environment. Should these effects arise, they will be addressed through existing regulatory processes, as well as the planning application process To ensure that the potential for these effects is recorded, and to allow for the SEA findings to directly inform the consideration of relevant issues at the local and project levels, it is proposed that the SEA acknowledge the potential for secondary effects associated with this topic.
Landscape and visual impacts	Y	The key components and objectives of the DRS are aimed primarily at improving recycling quality and quantity for select single-use drink containers, and reducing litter of those materials in both terrestrial and marine environments. As such, the DRS is expected to have significant impacts related to landscape and visual impacts which is scoped into this SEA.

In summary, following consideration of the DRS and the likely significant effects, the following topics have been scoped into this SEA: **material assets; climatic factors; landscape and visual impacts;** and **biodiversity**, **flora and fauna**. In addition, there could be range of other associated impacts on topic areas such as soil, air, water and cultural heritage through the siting, construction and operation of the DRS facilities which are also acknowledged in the **cumulative effects section** (Section 8).

3.2 Context for the Assessment

3.2.1 Review of Plans and Programmes

The Environmental Assessment (Scotland) Act 2005 requires a report containing "an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes"



(Schedule 3(1)) as well as "The environmental protection objectives, established at international (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation" (Schedule 3(5)).

One of the first steps in undertaking the SEA of example schemes is to identify and review other relevant plans, programmes and strategies (PPS) which could influence the plan. These may be PPS at an international/European, national, regional or local level, commensurate with the scope of the DRS. The review aims to identify the relationships between the DRS and these other documents i.e. how the DRS could be affected by the other plans' and programmes' aims, objectives and/or targets, or how it could contribute to the achievement of their environmental and sustainability objectives. It is also a valuable source of information to support the completion of the environmental baseline analysis used to identify the key issues relevant to the assessment of the DRS.

For each topic scoped into the SEA (and so the subsequent topic sections), the SEA provides a review and summary of PPS relevant to the DRS.

3.2.2 Environmental Baseline

The Environmental Assessment (Scotland) Act 2005 require a report containing "The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme" (Schedule 3(2)), "The environmental characteristics of areas likely to be significantly affected" (Schedule 3(3)), and "Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC)" (Schedule 3(4)).

In each SEA topic section, a baseline is provided of the current receptors which will be impacted by introduction of the DRS. The baseline provides information against which key metrics for the DRS (such as tonnes of material recycled and carbon emissions) can be assessed to determine the impact of the DRS throughout its operation. The evolution of this baseline is taken to be the Business as Usual (BAU) option. Each example DRS is assessed against this BAU baseline to determine the impact, positive or negative, that each example scheme may deliver.

3.3 Primary and secondary effects

An assessment of each example scheme has been undertaken in relation to the four SEA topics: climatic factors, material assets, landscape and visual impacts and biodiversity.

The assessment adopts a two-tier approach. The **primary tier** explores the potential for significant, primary, environmental effects within the SEA scoped in topic. The **secondary tier** explores the indirect or secondary effects associated with the adoption of the DRS.

3.3.1 Assessment questions

To support the assessment of the primary and secondary tier effects, assessment questions have been developed. The assessment questions have been designed to ensure that the SEA focuses on the key environmental impacts relevant to each scoped in topic areas in the context of wider policy objectives, and to explore the potential for indirect and secondary environmental effects. They have been amended following scoping consultation.

The Tier 1 and Tier 2 questions are presented in

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Table 3.2.



Table 3.2 DRS SEA Assessment questions

SEA Topic	Tier 1 Question	Tier 2 Question
	Will the DRS: a. Protect and/or enhance designated nature conservation sites e.g. Special Areas of	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?
Biodiversity	Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites? b. Support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions? c. Help avoid pollution of the	
	environments?	
Climatic Factors	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated outside of Scotland?
Material Assets	Will the DRS: a. Contribute towards achieving Scotland's waste targets? b. Increase the economic value and utility of affected materials? c. Reduce 'leakage' of material to landfill or energy recovery or as litter?	Does the DRS have the potential for additional direct or indirect impacts on Material Assets?
Landscape and Visual Impacts	Will the DRS reduce littering of material into terrestrial and marine environments?	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?
Other topic areas		Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?

The SEA assessment questions in

Please note that the sequence in which the effects against the topics in Table 3.2 have been considered in the subsequent chapters of this report have been reordered to reflect areas of key interest to policy makers.

3.4 Undertaking the Assessment

The activities associated with each example scheme have been examined to identify, describe and evaluate (where possible) the likely significant effects that could arise drawing on the following to inform the assessment:

- consultation with statutory consultees and other stakeholders;
- the contextual information including a review of PPS, the regulatory framework and baseline;
- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g. short, medium or long term);
- the geographic scale of the potential effect (e.g. local, regional, national);
- the location of the potential effect (e.g. whether it affects rural or urban communities);
- the potential effect on vulnerable communities or sensitive habitats;
- the reasons for whether the effect is considered significant;
- the reasons for any uncertainty, where this is identified; and
- the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where available).

Where quantitative data is not available, the assessment is based on best-available qualitative information and professional judgement.

The findings of the assessment for each example scheme for each topic are presented in the following format.



Example Scheme Name e.g. Take back to dedicated points						
Materials in sco Type of scheme Deposit Capture rate	pe e.g. Plastic, Glass an e.g. Take back to de e.g. £0.20 e.g. 60%	d Metal dicated points				
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary			
Ρ	Will the DRS contribute towards achieving Scotland's waste targets?	÷	Assessment of Effects: This example scheme is Mitigation: Locating dedicated points in urban areas will Assumptions: It is assumed that Uncertainties: It is unknown where the			

The key to each assessment score is shown below.

	++	+	0	-		
Score Key:	Significant	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
NB: where more than Where the scores are	one symbol is prese both positive and n	ented in a box it indi egative, the boxes a	cates that the SE ire deliberately n	A has found more th ot coloured (i.e. 'no	han one score for th overall effect'). Wh	e category. ere a box is

Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.

3.5 Assessment of Secondary, Cumulative and Synergistic Effects

Schedule 3 (6) (e) of the Environmental Assessment (Scotland) Act 2005 requires that the "secondary, cumulative and synergistic effects" of the DRS are assessed. This will provide an overview of all the effects of each example scheme (include these effects identified through the use of the tier 2 questions) as well as those in-combination with other plans and programmes. This is presented in Section 8.

It should be noted that the cumulative effects of the example schemes are difficult to accurately assess given the inherent uncertainties concerning (inter alia): the preferred example scheme, the timing of implementation, the location and specific nature of any infrastructure and the actual capture rates.

3.6 Identifying Mitigation and Monitoring Proposals

Identifying effective mitigation measures is also a fundamental part of the SEA and where significant negative effects have been identified, appropriate mitigation measures have been proposed. This has been presented for each example and topic within the assessment matrix. In some instances, mitigation measures are also proposed for minor negative effects and, where appropriate, enhancement measures have also been identified.

3.7 Difficulties Encountered in Undertaking the Assessment

Four example schemes have been assessed in this SEA. The assessment of each involves comparing the anticipated effects, both positive and negative, against the Business as Usual case – being current PPS but without a DRS.

Difficulties encountered in undertaking the assessments are summarised below:

- **Data limitations:** The availability of baseline data has been limited and, at times, information on key indicators cannot be found. In undertaking assessments where the baseline information is slight, inconclusive or absent, we have used the best-available information and professional judgement to assess the anticipated effects of each example scheme.
- **DRS infrastructure impacts:** The SEA considers high-level example schemes. As such, the exact location of infrastructure, the use of existing facilities versus requirement for new infrastructure, and the consequent impacts upon local environments are not known. It is also not known whether collected material will be reprocessed within Scotland or abroad. We have used professional judgement in assessing the high level expected impact of each example scheme and highlighted where such unknowns may impact (positively and negatively) on each example scheme.



4. Material Assets

This section outlines the assessment of each example scheme against the scoped in topic of material assets. Whilst the SEA legislation does not provide any definition of the term "material assets", the SEPA guidance³⁰ states that material assets include built assets and natural assets. The scope of "built assets and natural assets" is therefore defined, within this Environmental Report, as encompassing the following:

- Natural assets collected waste materials and waste stream;
- Natural assets raw source of compositional materials of collected drinks containers and any raw materials used to support waste infrastructure;
- Built assets land take and soil use/loss for new DRS infrastructure;
- Built assets any new DRS infrastructure required for the example schemes.

This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of each example scheme, regarding material assets.

4.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS relevant to the material asset topic and all example schemes are shown in



³⁰ SEPA (2016) Strategic Environmental Assessment SEPA Guidance Note 4: Guidance on consideration of material assets in Strategic Environmental Assessment. Available at:

https://www.sepa.org.uk/media/219432/lups-sea-gu4-consideration-of-material-assets-in-sea.pdf

Figure 4.1 and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.





The relationship between the identified PPSs and the DRS are outlined below.



United Nations (2015): Transforming our World - the 2030 Agenda for Sustainable Development sets out 17 global goals agreed by the United Nations. These goals are embedded within the agenda for 15 years and include commitments to protect the planet through sustainable consumption and sustainable management of resources. The DRS will support Scotland's efforts toward the global goals – in seeking to embed sustainability and resource minimisation across all sectors of society; from designing places to support sustainable living, to conserving natural assets through limiting damage from litter and contamination. Key sustainable development goals relevant to a DRS include:

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable;

Goal 12: Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

European Union (2008): The EU Waste Framework Directive introduced a definition for waste. The Directive introduced key principles to ensure that waste is managed without endangering human or environmental health.

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faring regard to the proposal lines the Conversion.		
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The directive also introduced the Waste Hierarchy, the "polluter pays principle" and the "extended producer responsibility". It included two new recycling and recovery targets to be achieved by 2020: 50% for re-use and recycling of household wastes and 70% for re-use, recycling and other recovery of construction and demolition waste. The Directive requires that Member States adopt waste management plans and waste prevention programmes. The Framework Directive sets a context for the DRS in directing member states to radically enhance waste management and recycling practices which has led Scotland to explore the opportunity for a DRS so to meet – and exceed – the recycling targets.

European Union (2018): The EU Action Plan for the Circular Economy details an EU Action Plan for the Circular Economy. The Action Plan includes a suite of programmes seeking to embed improved practices across the life cycle of products; from cradle to grave. The revised legislative proposals on waste set clear targets for waste reductions. Key elements of the revised waste proposal include:

- a common EU target for recycling 65% of municipal waste by 2030;
- a common EU target for recycling 75% of packaging waste by 2030;
- a binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030;
- a ban on landfilling of separately collected waste;
- promotion of economic instruments to discourage landfilling;
- simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;
- concrete measures to promote re-use and stimulate industrial symbiosis turning one industry's by-product into another industry's raw material;
- economic incentives for producers to put greener products on the market and support recovery and recycling schemes (e.g. for packaging, batteries, electric and electronic equipment, vehicles).

As above, the Action Plan provides a context for the DRS by requiring member states to radically enhance waste management and recycling practices; to design out waste and to design products that can be recycled (if not repaired/remanufactured) at end of life. This has led Scotland to explore the opportunity for a DRS so to meet – and exceed – the recycling targets.



UK Government (1990): The Environmental Protection Act seeks to improve resource use and environmental conditions through the control of waste collections and management across the UK. The Act designates the regime for licensing of waste operations and provides the first definition of "controlled wastes" (*known as Hazardous Wastes in Scotland*). The Act introduces the Duty of Care for producers, carriers, importers and exporters. The Act also introduced criminal offences regarding litter in a bid to reduce littering across the UK. The Act requires the UK to tightly control the movement and handling of wastes.



Scottish Government (2017): The Scottish Government Programme for

Scotland states the Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The programme commits the government to develop a DRS for drink containers across Scotland; to reduce the demand for virgin containers and promote capture and recycling of existing material. The programme will commit £500,000 to address litter sinks around the coast and to develop policy which addresses marine plastics. The programme seeks to increase recycling rates and reduce littering by examining how to reduce demand for single-use containers including development of an advisory group exploring fiscal options to reduce waste and boost the circular economy.





Scottish Government (2014): A Marine Litter Strategy for Scotland identified

five proposed strategic directions to reach a Zero Waste Scotland, supported by responsible behaviours. The strategy seeks to address litter within the marine environment between 2013 and 2020. The objectives of the strategy are to enhance current legislation to promote effective clean-up of contaminated areas, whilst supporting local and national stakeholders to understand, and support, litter free urban areas. The strategy seeks to reduce the litter entering the marine environment, by educating visitors to reduce littering and promote recycling of wastes with Zero Waste Scotland (both onshore and offshore – such as fish nets), incentivising better harbourside recycling infrastructure and behaviour changes, improving monitoring protocols and recording mechanisms, in conjunction with local stakeholders. This strategy complements the DRS in pushing for greater recycling through awareness and improved infrastructure; A DRS would therefore

support the drive to reduce littering in a marine environment.

Scottish Government (2014): Toward a Litter free Scotland - The National Litter Strategy (2014) sets clear actions which have an impact upon material assets, when seeking to improve the environment through targeted approaches to litter and fly-tipping. The strategy seeks to educate the public to adopt alternative behaviours to waste management, through access to improved recycling opportunities, improved product design, awareness campaigns and targeted exploration to tackle litter on beaches. The strategy also proposes exploring enforcement opportunities and identifying pilot solutions to litter. The DRS will support delivery of these actions and ambitions by incentivising recycling of material that would otherwise be littered.





Scottish Government (2016) Making Things Last – A Circular Economy

Strategy is Scotland's first circular economy (CE) strategy. The strategy endeavours to set out early priorities to embed CE across key Scottish sectors including manufacturing. The strategy seeks to embed CE principles into the manufacturing process, to design packaging materials for reuse, recycling and recovery in partnership with packaging industries, whilst embedding a mindset across the public that materials are finite and that current consumptions patterns are unsustainable – and repeats the targets to recycle 70% of all waste, and to send no more than 5% of all waste to landfill, both by 2025. The document states the government's exploration of new technologies and lessons from abroad – notably paying particular reference to DRS.



Scottish Government (2013): Safeguarding Scotland's Resources set out the ambition to minimise the resources needed to sustain the market demand for products in Scotland. The document sets out a range of measures to promote efficient use of materials and to reduce waste. A total of 13 actions are proposed to develop baseline evidence for circular economy opportunities, to influence behaviours, enhance the design of products and packaging, and to support businesses to prevent, manage and benchmark wastes. The Programme's actions will supplement the behaviour change across society in supporting efficient and responsible management of resources.





Scottish Government (2013): Scotland's Zero Waste Plan set out the Scottish Government's spearhead strategy to make the most of resources and to reduce, reuse and recycle more materials in Scotland. Measures to achieve the vision include using separate collections of specific waste types, increasing reuse and recycling opportunities and introducing new recycling targets of 70% of all waste recycled by 2025 and a maximum of 5% of all waste to landfill by 2025. The Zero Waste Plan is the flagship policy for Scotland's waste ambitions. The DRS will provide significant support to achieving the ambitious recycling targets by increasing capture of recyclate.

Scottish Enterprise (2016): A Manufacturing Future for Scotland details a series of interventions to be adopted which will help nurture further growth across the manufacturing sector. The strategy seeks to support companies to reap the benefits of the circular economy through the opportunities on product design, manufacturing processes and supply chains. The strategy seeks eradicate waste through innovation in product design and remanufacturing. The DRS can support he strategy by incentivising manufacturers to utilise the future quantities of clean and consistent material within their manufacturing processes.



Scottish Government (2014): The Scottish National Planning Framework and Scottish Planning Policy are two documents which promote waste as a resource. The framework and the planning policy recognise that the design of places can minimise waste whilst instilling responsible behaviours in providing waste infrastructure for public use. Of particular note the Scottish Planning Policy (para 176) supports "the emergence of a diverse range of new technologies and investment opportunities to secure economic value from secondary resources, including reuse, refurbishment, remanufacturing and reprocessing" whilst noting that





the planning scheme should "help deliver infrastructure at appropriate locations, prioritising development in line with the waste hierarchy: waste prevention, reuse, recycling, energy recovery and waste disposal".

Scottish Government (2011): The first land use strategy for Scotland, Getting the best from our land - A land use strategy for Scotland (2011)) had the objectives of: land-based businesses working with nature; responsible stewardship of Scotland's natural resources; and urban and rural communities better connected to the land. The vision, objectives and principles of the strategy were retained and built upon by the second land use strategy (published 2016) which covers the period 2016 – 2021. The strategy supports sustainable use of natural assets including DRS



target items (and their component ingredients) which can be conserved through effective capture and recycling of materials.



Scottish Government (2018): Climate Change Plan - The Third Report on Proposals and Policies 2018-2032 provides a progress update on the Governments Climate Change Plan. The update states the Governments plans to reduce emissions from waste through adoption of CE approaches. The Report reiterates ambitions to recycle 70% of all wastes by 2025 and to reduce all wastes sent to landfill by 5% by 2025. This will be delivered through support for businesses, local authorities and community action. The report repeats the Programme for Governments intention to introduce a DRS and will explore how to reduce demand for single-use items. An expert panel will be appointed to explore fiscal measures to explore such opportunities.

Local Authority Waste Strategies

Scottish Local Authorities have developed a range of local, tailored waste strategies which sets out the Authority's ambitions for waste services. The strategies justify any upcoming changes to services to meet legislative, budgetary or local requirements. Each strategy seeks to increase recycling tonnages and quality.

The example schemes will support local efforts to increase recycling. The DRS will provide conservative savings of £51M to £81M from costs associated with litter disamenity.



This section of the Environmental Report identifies and characterises current environmental baseline conditions for material assets, along with how these are likely to change in the future, against which the effects of each example scheme is assessed.

As detailed in the section introduction, the scope of "built assets and natural assets" is defined within this Environmental Report, as:

- Natural assets collected waste materials and waste stream;
- Natural assets raw source of compositional materials of collected drinks containers and any raw materials used to support waste infrastructure;
- Built assets land take and soil use/loss for new DRS infrastructure;
- Built assets any new DRS infrastructure required for the example schemes.

The data has been drawn from a variety of sources, including a number of the PPS reviewed as part of the SEA process (see Section 4.1).

4.2.1 Current Resource Use, Waste Management and Disposal of Materials Relevant to the DRS

This section gives a summary of the current waste generation quantities of materials relevant to the DRS and their management and disposal.

Waste Generation and Disposal

Between 2005 and 2015, the amount of Scottish waste sent to landfill decreased by 42%. Over the same period, the amount of biodegradable municipal waste landfilled in Scotland decreased by 51%. The household waste recycling rate in 2016 was 45.2%, increasing from 44.2% in 2015.

The proportion of households reporting that they recycled a range of other waste items increased each year between 2003 and 2011; however, between 2011 and 2015 there was little change in the percentage of households recycling each item, except for plastic bottles which increased by 7 percentage points to 82%.

DRS target materials arise primarily from households and businesses (mainly hospitality and municipal sources).

The mass of in-home drinks container waste generated in 2016 and recycling and residual rates are show in **Table 4.1** and **Figure 4.2**. These figures show that a higher percentage of glass and plastic (PET and HDPE) drinks containers are recycled than included within residual waste. However, for steel and aluminium drinks containers and cartons, a higher proportion are included in residual waste. The tonnage of disposable cups collected annually is unknown.

Table 4.1 In-home drinks container waste (2016)

Material	Tonnes collected annually	% recycled	% residual
Glass drinks containers	160,064	59%	41%
Steel drinks containers	3,284	46%	54%
Aluminium drinks containers	13,141	49%	51%
Plastic (PET) drinks containers	27,320	53%	47%
Plastic (HDPE) drinks containers	16,376	53%	47%
Cartons	7,239	39%	61%

Disposable cups	unknown	0%	100%
Source: Zero Waste Scotland			

Figure 4.2 In-home drinks container waste (2016)



Source: Zero Waste Scotland

The hospitality sector is the primary contributor to outside-home drinks container waste. Data for waste outside of the home is not as robust as in-house due to a lack of waste composition data. **Table 4.2** and **Figure 4.3** show outside-home drinks container waste generated in 2017 and recycling and residual rates. These figures show that a very high percentage of glass drinks containers are currently recycled, in contract to disposable cups which have a high residual rate. Half of steel, aluminium and plastic (PET) drinks containers are recycled with the other half ending up in residual waste. The tonnage of plastic (HDPE) drinks containers is zero.

Table 4.2 Outside-home Drink Container Waste (2017)

Material	Tonnes collected annually	% recycled	% residual
Glass drinks containers	27,967	95%	5%
Steel drinks containers	39	50%	50%
Aluminium drinks containers	1,872	50%	50%
Plastic (PET) drinks containers	5,799	50%	50%
Plastic (HDPE) drinks containers	0	0%	100%
Cartons	170	10%	90%
Disposable cups	7,122	1%	99%

Source: Zero Waste Scotland

Figure 4.3 Outside-home drinks container waste (2017)



Source: Zero Waste Scotland

4.2.2 Current Infrastructure Associated with Waste Management.

There are a number of routes through which the DRS target materials are currently collected and managed. For example, local authorities may collect key kerbside recyclate (plastics, steel, metals, glass) through kerbside collections, bring sites (bottle banks), and Civic Amenity sites (Household Waste Recycling Centres), as well as from commercial and other non-household sources. The exception is disposable cups, for which there recycling services and infrastructure are very limited.

In 2015, there were 198 HWRC's and multiple activity sites in Scotland which recycle multiple materials including glass and plastic wastes. Data specifying how many of these sites recycle plastics and glass is not available. The annual capacity of HWRC's as reported in 2015 was 5,756,633 tonnes with current waste accepted being 2,302,141 tonnes³¹.

With regards to metal recycling, in Scotland there are a total of 213 sites which either focus on metal recycling independently or as a multiple activity site. The current waste accepted is 1,308,562 tonnes, with an annual capacity of 4,348,102 tonnes³².

4.2.3 **Predicted Future Trends in Relation to Scottish Government Waste Targets.**

Scotland's recycling rate has increased since 2011, as shown in **Figure 4.4**³³. This is likely because of the rollout of separate waste collection services and continued behavioural change of businesses and households. Additionally, Scotland's landfill rate is gradually declining because of improved source separation, behavioural change and increasing alternative treatment capacity. Despite this, substantial and sustained annual reductions in waste to landfill will be required to achieve the 2025 target.

³² SEPA (accessed 2018) *Waste Sites and Capacity Tool. Accessed at:* <u>https://www.sepa.org.uk/data-visualisation/waste-sites-and-capacity-tool/</u>

. . .

³¹ SEPA (accessed 2018) *Waste Sites and Capacity Tool. Accessed at:*

³³ Scottish Parliament. Written submission from Zero Waste Scotland following Waste Evidence Session on 20 June 2017. Accessible at: http://www.parliament.scot/S5_Environment/General%20Documents/20170630 - ZWS_additional_WE_on_Waste.pdf





The Scottish Government key waste targets are shown in **Table 4.3**. By increasing recycling rates for target materials, and removing these from the residual waste stream, a DRS would support all three policy objectives.

Table 4.3 Scottish Government waste policies and targets relevant to the DRS

Policy Type	Description	Source
Legislative Ban	Ban on Biodegradable Municipal Solid Waste to Landfill by Jan 1st, 2021	Waste (Scotland) Regulations 2012 ³⁴
Target	70% of all waste recycled by 2025	Making Things Last ³⁵
Target	Max 5% of all waste to landfill by 2025	Making Things Last

Scottish Government and local authority efforts are driven by an ambition to reduce waste sent to landfill. Efforts to introduce resilient kerbside collection services, and improved packaging standards (supported indirectly through the intense attention upon the Circular Economy), are increasing recycling rates at the kerbside. It is anticipated that these efforts, and the ongoing growth in recycling figures, would lead to a steady but slowing increasing rate across the country.

4.2.4 Likely Evolution of the Baseline without the DRS

The Scottish Government has shown a continued commitment to explore and adopt ever more ambitious resource management targets. These targets seek to incentivise innovation in product design and waste management. The DRS is the latest opportunity to enhance the capture of target materials whilst incentivising investment in reprocessing technologies for complex materials (such as single-use paper based cups).

The baseline for our assessments assumes that recycling rates and per capita arisings of target materials will remain constant over the next 25 years, whilst material arisings increase in line with population growth.



³⁴ The Scottish Government (2012). *Waste (Scotland) Regulations*. [online] Available at: https://www.legislation.gov.uk/sdsi/2012/9780111016657/contents

³⁵ The Scottish Government (2016) *Making Things Last – A Circular Economy Strategy for Scotland* [online] Available at: http://www.gov.scot/Resource/0049/00494471.pdf

It is critical that the Scottish Government pursue further policies, strategies and mechanisms if it is to maximise Scotland's' potential to meet our waste and recycling targets. The DRS is therefore a key opportunity to increase recycling rates and help deliver our waste and recycling obligations.

It should be noted that the current political environment may also impact upon the evolution of drink container design and recovery ambitions. Whilst the delegation of EU based powers to Scotland remains unconfirmed at time of writing, it is possible that responsibility for waste packaging and product regulations and waste producer responsibility regulations will remain with the UK Government rather than be devolved to the Scottish Government. In such circumstance, it is unclear whether there will be future alignment of ambition between the UK and Scottish Government on these matters and whether future legislation will provide further encouragement to manufacturers to design for both waste minimisation in production processes as well as design for recycling and recovery.

4.3 The likely significant environmental effects of the Draft DRS and the reasonable alternatives

The assessment considers the anticipated changes to the material demand for producing drinks and drink containers and the built infrastructure to manage these wastes.

The production of new drink containers from virgin materials can contribute to pressures on renewable and non-renewable resources, through demand for paper/cardboard, glass, metal and plastics (derived from processing of crude oil and natural gas). Where spent containers are recycled and remanufactured, the material demand is significantly reduced. The DRS principles seeks to increase both the *quantity* and the *quality* of recyclate collected; to provide a strong reduction in the tonnage of materials required to generate any shortfall in quantity of containers needed by the market.

The built assets include waste infrastructure which facilitates the collection, reprocessing and/or disposal of the materials as a waste. The scope includes the land used and loss of habitats therein.

The example schemes all seek to reduce the "leakage" of recyclable materials from the scheme. This leakage includes the materials incorrectly diverted to recovery and disposal. The leakage also includes the significant tonnage of materials that escape the scheme in the form of litter; both on land and in the marine environment. The DRS will provide an element of encouragement to allow consumers and businesses to return target materials into the DRS for recycling into new containers.

A summary of all material and carbon impact savings from each example scheme is consolidated in **Table NTS 4**.

The assessment questions forming the basis of the **primary tier** and **secondary tier Material Asset assessment** are shown below:

Tier	Assessment Questions
	Will the DRS:
Primary Tier	a. contribute towards achieving Scotland's waste targets?
	b. increase the economic value and utility of affected materials?
	c. reduce leakage of material to landfill and/or energy recovery or as litter?
Secondary tier	Does the DRS have the potential for additional direct or indirect impacts on Material Assets?

The primary tier effects are assessed first. The Secondary tier effects follow. The key to each assessment score is shown below.



	++	+	0	-		?
Score Key:	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.						

Example Scheme 1: Take back to dedicated points			
Materials in sco Type of scheme Deposit Capture rate	pe Plastic (PET), Glass a Take back to dedica £0.20 60%	and Metal ated points	
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS contribute towards achieving Scotland's waste targets?	+/?	 Assessment of Effects: This example scheme is simpler to implement, targeting fewer materials for which recycling routes are already established. This example is anticipated to increase capture rates to 60% for all DRS materials. If this example scheme were implemented, it is anticipated that an additional 1,060kt of glass, 28kt of ferrous metals, 126kt of non-ferrous metals and 261kt of plastics wastes will be diverted from disposal and recycled by 2043. This example will incentivise consumers to return containers to recoup their deposit; however, this will only work in practice where convenient, dedicated take back points are available, despite the increased deposit value. If the dedicated take back points are inconveniently located, this example scheme may not realise the recycling rates for the collected material which in turn will not have the effects anticipated in terms of reducing demand for virgin material use.



³⁶ Zero Waste Scotland (2018) DRS BRIA

³⁷ Zero Waste Scotland (2018) DRS Equality Impact Assessment (interim)

	Example \$	Scheme 1	: Take back to dedicated points
			an element of material that would otherwise have been littered. Uncertainties: None
Ρ	Will the DRS increase the economic value and utility of affected materials?	+/?	This example scheme can improve the value of the collected materials by providing segregated and clean materials for reprocessors; however, the current quantity of contaminated material versus the potential clean material from the example scheme is unknown to validate this judgement The management of liquid contamination within the scheme is a general issue to be addressed, which may have differing implications by container type, e.g. where the container has a closed lid.
Ρ	Will the DRS reduce leakage of material to landfill or energy recovery or as litter?	++	This example scheme is expected to provide a reduction of recyclable materials which are incorrectly disposed of to landfill and EfW plants. The expected increase in capture rates demonstrates a justification that the example scheme will support a reduced use of natural assets to develop virgin products. The non-acceptance of HDPE bottles could lead to transitory consumer confusion around what is and is not accepted via the DRS; however, the scheme (RVMs) will refuse to pay out any deposit on non-labelled materials presented by consumers. This immediate feedback will mean that consumers will learn rapidly what is, and what isn't, accepted in this example scheme. DRS have been implemented in a number of countries worldwide and where the effect of these schemes on litter has been reviewed, they have typically identified that a DRS is an effective instrument against littering. A study by the European Commission reviewed DRSs in Denmark, Norway and a pilot project in the Catalan. The study concluded that quantifying the direct causal effect was difficult, those countries operating a DRS show low littering rates of drink packaging. The benefits of a DRS are most apparent in those countries with comparatively low levels of recycling prior to implementation of the DRS.
			These findings are supported by a number of other studies. Following on from the Catalan pilot DRS, a further study estimated a reduction in the littering of drink containers from 1,280 tonnes to 173 tonnes per year (a reduction of 86%) if the scheme were to be fully implemented. In the USA eight states legislated for the implementation of a DRS in the 1970/80s, with rates of litter reduction ranging from 30-64% ³⁸ . A study by Ghent University that reviewed the effects of DRS in the Netherlands, Germany and Israel concluded that a DRS could be expected to reduce littering by 40%. In light of the broad range of studies that have identified a

³⁸ Container Recycling Institute (2016) *Bottle Bill Resource Guide*. Available at: <u>http://www.bottlebill.org/about/benefits/litter/bbstates.htm</u>

Example Scheme 1: Take back to dedicated points			
			reduction in littering as a result of the implementation of a DRS, it is reasonable to assume that the operation of a DRS in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in the lower end of the region 30-50%.
			It is expected that capture rates may reach 60% of materials which would mean a reduction in materials in residual waste going to landfill or EfW.
			However, caution should be exercised regarding the reality in reaching this level of improvement due to the inconvenience to users of using this design of this example scheme and requiring journeys to select sites.
			The benefits to the built assets will be dependent upon the capacity of existing infrastructure to manage the increased tonnages. Where additional infrastructure is required this will elicit negative impacts upon local soils and air quality levels. In addition. Use of existing infrastructure to house a counting centre will be beneficial in reducing construction of new facilities.
	Does the DRS have the potential for additional direct or indirect impacts on Material Assets?		It is assumed that the increase in capture rate will include an element of material that would otherwise have been littered. This will further benefit the environment in removing physical hazards and sources of contaminants from affecting soil, fauna, flora, beaches and waterways; a position supported by the Marine Conservation Society.
S		?	The use of a limited number of dedicated take back points may increase vehicle movements by rural-based consumers to these sites – these issues are discussed further in the BRIA ³⁹ and within the EQIA ⁴⁰ . In addition, vehicle movements to collect the material and transport to counting centres or reprocessors may be substantial. If the dedicated points are sited in areas of congestion, or where road traffic is poorly regulated, this could impact upon local air quality. However, no studies on vehicle movements has yet been undertaken to validate this assumption. It is also possible that emission from these vehicle movements could be offset from a reduced need for local authorities to collect household wastes and manage street litter.
			If new facilities must be sited, constructed and operated for this example scheme – such as the counting centre – this will incur an impact upon the local environment through construction works and/or operations – as well as vehicle movements (transport impacts will be proportionally greater from rural areas where distances to dedicated points are increased).
			There will be composition implications for existing infrastructure used to handle and reprocess target materials that might be diverted via this example scheme. Flows of certain materials may also be subject to variations over time, e.g. linked to weather-

³⁹ Zero Waste Scotland (2018) DRS BRIA
 ⁴⁰ Zero Waste Scotland (2018) DRS Equality Impact Assessment (interim)



Example \$	Scheme 1	: Take back to dedicated points
		dependent purchasing patterns and new product promotions.
This example scheme ho Scottish Governments w take back points are loc communities. This is like which if sited in areas o impact upon local air qu	as the potent vaste strateg ated in area. ly to increas f congestion vality. Howey	tial to capture up to 60% of target material. This is set to support the ies and targets. However, this will only occur where the dedicated is of convenience, and may not be readily accessible for rural e travel with consumers taking materials to the dedicated points, (such as bust HWRCs), or where road traffic poorly regulated, could ver, haulage logistics will be simpler.
This example scheme w streets and marine envi	ill have a pos ronments.	sitive impact upon litter with anticipated reductions of litter from
This example scheme is material coverage, whe environment.	unlikely to d re product p	rive the same level of societal change in behaviour as one with wider urchase and product return activities are integrated within the retail
This example may utilise part depend on the tech	e Reverse Ve nology selec	nding Machines (RVMs) and the schemes long term success will in tion, its reliability and the avoidance of redundancy.
Capture rates demonstr materials will be collect any, in terms of reproce	ate a positiv ed for reuse; ssors (if insu	e impact upon the natural assets and built assets wherein recyclate however, it is not known what new built assets will be required, if fficient capacity is an issue).
To minimise the materic existing infrastructure for there will be a detriment operation and vehicle m	al impact of t or use as cou tal effect up ovements.	this example scheme, the example scheme should seek to utilise Inting centres. If there is a need to construct dedicated facilities, on local environments from the carbon emissions of construction,
It can be concluded tha examples. This example environmental strategi	t this examp scheme wi es.	le scheme offers the lowest overall benefits of all the four Il offer very limited contribution to the Scottish waste and

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

Materials in scope Type of scheme Deposit Capture rate	All Materials Take back to dedi £0.20 70%	cated points and a	some shops (with cartons and cups)
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Р	Will the DRS contribute towards	++	Assessment of Effects: This example scheme offers a wider range of dedicated take back points along with some shops which will increase the convenience



Example Scheme 2: Tak	e back to d	dedicated points and some shops (with cartons and cups)
achieving Scotland's waste targets?		to consumers to return their containers. In addition, the wider range of materials will further encourage consumers to recycle materials and embed a mentality of recovering resources.
		This example scheme also creates an opportunity for brands and retailers to become more engaged in the post-consumer management of their product packaging. In consequence, this example scheme is assessed as supporting the protection and conservation of natural assets whilst limiting demand for compositional materials for virgin products.
		If this example scheme were implemented, it is anticipated that an additional 1,239kt of glass, 32kt of ferrous metals, 147kt of nonferrous metals, 446kt of plastics and 208kt of paper and cardboard wastes will be diverted from disposal. The increased range and quantities of materials in this example scheme may pose an issue if no reprocessors or off-takers can be found for traditionally problematic materials such as paper based cups - however a ready market exists for use of these materials within recovery services to produce soil additives.
		Overall, this example scheme would support the aim of improving use, and minimising quantities, of waste materials and their compositional components (natural assets) through recycling of valuable materials into new products or uses.
		If the dedicated take back points are inconveniently located, this example scheme may not realise the full recycling rates for the collected material which in turn will not have the effects anticipated in terms of reducing demand for virgin material use. The increased level of deposit value will further encourage consumers to make the effort of using he service.
		The example scheme may require additional built assets to manage the additional tonnage of material collected including a counting centre. Where current infrastructure is used for the counting centre, this scheme will contribute toward aims to minimise construction of built assets. If new facilities are required, it is likely that there would be localised effects from construction (including employment, land take, changes to the urban form, traffic and temporary loss of amenity). If the selected site were classified as previously developed land, the reuse of land could be considered beneficial (as it would be bringing an area back into economic use).
		Where current reprocessors are used, as would be expected, this will also contribute toward aims to minimise construction of built assets assuming sufficient capacity exists for the increased capture rates. Engagement should be undertaken with reprocessors to confirm suitable capacity to reprocess the increased tonnages of recyclate. If any additional assets require to be constructed, this could therefore have a localised adverse effect on land, air quality and carbon emissions, from construction.
		Mitigation:

and cups)			
			A wide number of dedicated take back points and shops will maximise capture rates and will embed a culture and ethos of returning materials for their deposit values. Use of existing facilities – storage, counting and/or reprocessing, will minimise environmental impact upon natural assets.
			The use of localised dedicated take back points use of some local shops will minimise use for additional travel and use of cars – as otherwise anticipated at more remote take back points. However, this may lead to increased vehicle movements by reprocessors transporting material from increased take-back points to the counting centre; smart routing, or reverse logistics, could be used to minimise travel impacts including carbon emissions and congestion.
			Use of a Scottish label on materials will minimise contaminants to the example scheme. RVMs (and manual return points) will only refund deposits on containers bearing the correct logo. Materials without the logo will be kept by the machine only if it is recyclable but no deposit will be refunded. Non-recyclable containers will be returned to the consumer.
			Assumptions:
			It is assumed that the increased capture of materials will include an element of material that would otherwise have been littered.
			Uncertainties:
			It is unclear at this point if the single-use paper based cups would be transferred to a paper mill or to a dedicated facility. As a problematic waste stream – more so for mixed material single-use cups – it is necessary to have proven technology in place with adequate capacity.
			It is not known what waste licensing controls will apply at retail sites receiving returned containers. It is not known if the co- ordinating agency will be responsible for addressing (and funding) these issues, or if obligations fall on receiving retailers (as waste
			producers).
			producers). It is unclear whether all sites will be required to accept all materials or will there be some variability depending on site space restrictions. If there is some variability, consideration will be required on how to communicate to consumers what materials will be accepted at sites which will receive a more limited range of materials.
Ρ	Will the DRS increase the economic value and utility of	+/?	 producers). It is unclear whether all sites will be required to accept all materials or will there be some variability depending on site space restrictions. If there is some variability, consideration will be required on how to communicate to consumers what materials will be accepted at sites which will receive a more limited range of materials. This example scheme can improve the value of the collected materials by providing segregated and clean materials for reprocessors in increased tonnages. The current quantity of contaminated material versus the potential clean material from the DRS is unknown to validate this judgement.



Example So	cheme 2: Tak	e back to c	ledicated points and some shops (with cartons and cups)
			implications by container type, e.g. where the container has a closed lid. There is also a risk of increased contamination from new materials added (straws, lids etc.).
Will the DRS reduce leakage of material to 	Will the DRS reduce leakage of material to		This example scheme is expected to provide a reduction of recyclable materials incorrectly disposed of to landfill and EfW plants. The expected increase in capture rates demonstrates a justification that the example scheme will support a reduced use of natural assets required to develop virgin products.
	++	In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS, it is reasonable to assume that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in the middle of the 40-60% region. It is expected that capture rates may reach 70% of materials. It is reasonable to assume this will also mean a reduction in materials going to landfill or EfW'	
			The benefits to the built assets will be dependent upon the capacity of existing infrastructure to manage the increased tonnages. Where additional infrastructure is required this will elicit negative impacts upon local soils and air quality levels.
Does t have t potent additid direct indirec Mater Assets	Does the DRS have the potential for additional direct or indirect		It is assumed that the increase in capture rate will include an element of material that would otherwise have been littered. This will further benefit the environment in removing physical hazards and sources of contaminants from affecting soil, fauna, flora, beaches and waterways; a position supported by the Marine Conservation Society.
	impacts on Material Assets?		The use of localised and dedicated take back points, along with some shops will facilitate residents walking to the return points, however collection from the increased numbers of these points and associated vehicle movements and vehicle emissions could affect local air quality.
		?	If new facilities must be sited, constructed and operated for this example scheme, this could have an effect on the local environment through construction works and/or operations, as well as vehicle movements (transport impacts will be proportionally greater from rural areas where distances to hubs are increased. These issues are discussed further in the BRIA ⁴¹ and within the EQIA ⁴²).
			There will be composition implications for existing infrastructure used to handle and reprocess target materials that might be diverted via a DRS. Flows of certain materials may also be subject to variations over time, e.g. linked to weather-dependent purchasing patterns and new product promotions.

⁴¹ Zero Waste Scotland (2018) DRS BRIA
 ⁴² Zero Waste Scotland (2018) DRS Equality Impact Assessment (interim)



Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

This example scheme will allow consumers to return a wider range of containers to more convenient take back points including some shops. This will increase the material recovered and quality by segregating target materials from food wastes and other residual waste contaminants. This example scheme has the potential to capture up to 70% of target material. This example scheme is set to support the Scottish Governments waste strategies and targets.

Capture rates demonstrate a positive impact upon the natural assets and built assets wherein recyclate materials will be collected for recycling – however as noted in the previous example scheme (Example 1), it is not known what new built assets will be required, if any, in terms of the counting centre and reprocessors (if insufficient capacity is an issue). The increased range and quantities of materials in this example scheme may pose an issue if no reprocessors or off-takers can be found for traditionally problematic materials such as paper based cups - however a ready market exists for use of these materials within recovery services to produce soil additives.

This example scheme may utilise Reverse Vending Machines (RVMs) and long term success will in part depend on the technology selection, its reliability and the avoidance of redundancy.

The example scheme will have a positive impact upon litter with anticipated reductions of litter from streets and marine environments.

This example scheme will contribute toward the Scottish waste reduction ambitions whilst minimising material asset impacts. This example will allow for a more accessible DRS across Scotland which can provide a similar level of accessibility to urban and rural residents. The example scheme will provide a positive impact on litter tonnages. This example scheme is therefore assessed as being advantageous and supportive to Scottish waste and environmental ambitions.

Example Scheme 3: Take back to any place of purchase

Materials in scope Type of scheme Deposit Capture rate	Plastic (PET), Glass and Metal Take back to any place of purchase £0.10 80%		
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS contribute towards achieving Scotland's waste targets?	++	Assessment of Effects: This example scheme will incentivise consumers to return containers to recoup their deposit. It will increase the provision and accessibility of collection points, as containers can be taken back to any place of purchase). This will provide a convenient scheme for consumers to redeem their deposit. As retailers will be hosting the return sites, the example scheme



Example So	cheme 3: Take back to any place of purchase
	creates a substantial opportunity for brands and retailers to become more engaged in the post-consumer management of their product packaging.
	This example scheme is anticipated to increase capture rates to 80%. If this example scheme were implemented, it is anticipated that an additional 1,416kt of glass, 37kt of ferrous metals, 168kt of non-ferrous metals, 349kt of plastics will be diverted from disposal and recycled by 2043.
	There is a lower deposit value associated with this example scheme which could be argued may affect the motivation for consumers to return items to a retailer, but evidence indicates that convenience and deposit value are the critical drivers of DRS participation. The increased convenience offered by this example scheme is expected to maximise uptake and capture of target materials.
	This example scheme will turn the logistics network through which returned containers are counted/cleared into a multi 'hub and spoke' scheme - where each retail outlet is considered a spoke. The flow of materials and supporting logistics associated with this example scheme is more complex.
	Retailers can use either RVMs or, where space is limited, large bags which are collected and returned to counting centres for counting and separation. Use of the bagging scheme will require significant space in small retailers.
	1 counting centre and 4 bulking sites are required. This scheme should aim to minimise construction of new built assets through use of existing infrastructure. If new facilities are required, it is likely that there would be localised effects from construction (including employment, land take, changes to the urban form, traffic and temporary loss of amenity). If the selected site were classified as previously developed land, the reuse of land could be considered beneficial (as it would be bringing an area back into economic use).
	Where current reprocessors are used, as would be expected, this will also contribute toward aims to minimise construction of built assets assuming sufficient capacity exists for the increased capture rates.
	Under this example scheme, it is stated that the agency set up by industry to co-ordinate delivery of the example scheme would be responsible for compensating retailers for the containers that they accept back and for organising logistics collections from all of the return points. This has the potential to create considerable logistical challenges at individual sites, many of which (particularly amongst small, high-street outlets) suffer from restricted storage space for existing waste and recycling containers.
	Mitigation:
	Ensuring a wide number of return locations will maximise capture rates and will embed a culture and ethos of returning materials for

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Example Scheme 3: Take back to any place of purchase						
			their deposit values.			
			Use of a Scottish label on materials will minimise contaminants to the example scheme. RVMs (and manual return points) will only refund deposits on containers bearing the correct logo. Materials without the logo will be kept by the machine only if it is recyclable but no deposit will be refunded. Non-recyclable containers will be returned to the consumer.			
			Assumptions:			
			It is assumed that the increased capture of materials will include an element of material that would otherwise have been littered.			
			It is assumed that RVMs and manual collection points (in small retailers) would accept recyclable non-Scottish sourced containers without providing a deposit. Non-recyclable materials would be rejected.			
			Uncertainties:			
			It is not known what waste licensing controls will apply at retail sites receiving returned containers. It is not known if the co- ordinating agency will be responsible for addressing (and funding) these issues, or if obligations fall on receiving retailers (as waste producers).			
Ρ	Will the DRS increase the economic value and utility of affected materials?	+/?	This example scheme can improve the value of the collected materials by providing segregated and clean materials for reprocessors; however, the current quantity of contaminated material versus the potential clean material from the DRS is unknown to validate this judgement.			
			The management of liquid contamination within the scheme is a general issue to be addressed, which may have differing implications by container type, e.g. where the container has a closed lid			
Ρ	Will the DRS reduce leakage of material to landfill or energy	++	This example scheme is expected to provide a reduction of recyclable materials which incorrectly disposed of to landfill and EfW plants. The expected increase in capture rates demonstrates a justification that the example scheme will support a reduced use of natural assets to develop virgin products.			
	recovery or as litter?		In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS. It is reasonable to assume that the operation of a DRS in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in upper end of the region of 40-60%. It is expected that capture rates may reach 80% of materials which would mean a reduction in materials in residual waste going to landfill or EfW.			
			The benefits to the built assets will be dependent upon the capacity of existing infrastructure to manage the increased tonnages. Where additional infrastructure is required this will elicit negative impacts upon local soils and air quality levels.			
	Example So	cheme 3: T	ake back to any place of purchase			
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	Does the DRS have the potential for additional direct or indirect		It is assumed that the increase in capture rate will include an element of material that would otherwise have been littered. This will further benefit the environment in removing physical hazards and sources of contaminants from affecting soil, fauna, flora, beaches and waterways; a position supported by the Marine Conservation Society.			
S	impacts on Material Assets?	?	Vehicle movements to collect the material and transport to counting centres or reprocessors may be substantial. If the dedicated points are sited in areas of congestion, or where road traffic is poorly regulated, this could impact upon local air quality. However, no studies on vehicle movements has yet been undertaken to validate this assumption			
			There will be composition implications for existing infrastructure used to handle and reprocess target materials that might be diverted via the example scheme. Flows of certain materials may also be subject to variations over time, e.g. linked to weather- dependent purchasing patterns and new product promotions.			
			The example scheme may drive greater technology integration between upstream (product manufacture) and downstream (post- consumer management) processes to support material recovery by manufacturers, which is needed to embed Circular Economy principles within industry supply chains.			
	This example scheme will allow consumers to return the target materials to any place of purch conveniently situated in retailers' sites across the country. It will ensure wide access and requ limited behavioural change to facilitate. This will increase the material recovered and has the potential to capture up to 80% of target material. This example scheme is set to strongly supp the Scottish Governments waste strategies and targets					
	Compared to Examples Scheme 1 and 2, there is a lower level of deposit associated with this example scheme which could be argued may affect the motivation for consumers to return items to a retailer; however, this is offset by the convenience of return locations.					
	Capture rates demonstrate a positive impact upon the natural assets and built assets wherein recyclate materials will be collected for recycling.					
	The example scheme may drive greater technology integration between upstream (product manufacture) and downstream (post-consumer management) processes, which is needed to embed Circular Economy principles within industry supply chains.					
	This example will utilise Reverse Vending Machines (RVMs), in combination with manual take back methods; and the example schemes long term success will in part depend on the technology selection, its reliability and the avoidance of redundancy.					
	Given the increased collection tonnages and materials to be collected in this example scheme, consideration may need to be given to the capacity of the existing reprocessors to accommodate the increased material.					
	The example sche streets and marir	eme will have a ne environment	a positive impact upon litter with expected reductions of litter from ts.			
	This example scheme offers a strong opportunity to contribute toward Scottish waste and environmental objectives. The wider accessibility of the collection points will likely increase participation beyond the previous example schemes.					

Example Scheme 4: Take back to any place of purchase (with cartons and cups)

Materials in scope Type of scheme Deposit Capture rate Primary (P)	All Materials Take back to any place of purchase (with cartons and cups) £0.10 80%				
Secondary (S)	SEA Criteria	Score	Commentary		
	Will the DRS contribute towards achieving Scotland's waste targets?		Assessment of Effects: This example scheme will incentivise consumers to return a wide range of drink containers to recoup their deposit. It will increase the provision and accessibility of collection points, as containers can be taken back to any place of purchase and will provide a convenient scheme for consumers to redeem their deposit value. As retailers will be the return sites, this example creates a substantial opportunity for brands and retailers to become more engaged in the post-consumer management of their product packaging. This example scheme is anticipated to increase capture rates to 80%. If this example scheme were implemented, it is anticipated that an additional 1,416kt of glass, 37kt of ferrous metals, 168kt of non-ferrous metals, 510kt of plastics and 239kt of paper and cardboard will be diverted from disposal and recycled by 2043		
Ρ		++	 This will allow a significant tonnage of clean, segregated material to be available to reprocessors; reducing the demand for virgin materials; however, there must be technical knowhow – and capacity – to manage the problematic materials targeted such as single-use paper cups. Without adequate technology, collection of materials for the purposes of recycling may prove premature. It is not known what tonnage of contaminated material is currently refused by MRFs and reprocessors. Whilst no evidence can suggest what tonnage of contaminated material will consequently be available as clean material as a result of the example scheme, it can safely be assumed contamination will decrease to a degree, generating cleaner quantities of clean materials for recycling. Compared to Examples 1 and 2, there is a lower level of deposit associated with this example scheme which could be argued may affect the motivation for consumers to return items to a retailer; however, this may be offset by the convenience of the return locations. 		

Example Scheme 4: Take back to any place of purchase (with cartons and cups)

Retailers can use either RVMs or, where space is limited, large bags which are collected and returned to counting centres for counting and separation. Use of the bagging scheme will require significant space in small retailers.

A counting centre and 4 bulking centres are required. This example scheme should aim to minimise construction of new built assets by the use of existing infrastructure. If new facilities are required, it is likely that there would be localised effects from construction (including employment, land take, changes to the urban form, traffic and temporary loss of amenity). If the selected site were classified as previously developed land, the reuse of land could be considered beneficial (as it would be bringing an area back into economic use). Where current reprocessors are used, as would be expected, this will also contribute toward aims to minimise construction of built assets assuming sufficient capacity exists for the increased capture rates.

Under this example scheme it is expected, as with other DRS across Europe, that the agency set up by industry to co-ordinate delivery of the scheme would be responsible for compensating retailers for the containers that they accept back and organising logistics collections from all of the return points. This has the potential to create considerable logistical challenges at individual sites, many of which (particularly amongst small, high-street outlets) suffer from restricted storage space for existing waste and recycling containers.

The extended governance of the co-ordinating agency introduces additional stakeholder interfaces. This brings with it both opportunity and risk, which in the case of the former might make it easier for local authorities to actively engage in design and delivery of the implemented DRS, e.g. through shared platforms, logistics and downstream recycling infrastructure.

Mitigation:

Ensuring a wide number of return locations will maximise capture rates, ensuring convenience to consumers and minimising any need for additional vehicular journeys.

Use of a Scottish label on materials will minimise contaminants to the example scheme. RVMs (and manual return points) will only refund deposits on containers bearing the correct logo. Materials without the logo will be kept by the machine only if it is recyclable but no deposit will be refunded. Non-recyclable containers will be returned to the consumer.

Adequate technology must be proven and in place – with ample capacity for the tonnages expected. This is most prominent for single-use drink cups. If solely paper cups are accepted this could lead to contamination where mixed material single-use cups contaminate the material stream.

Assumptions:

It is assumed that only paper based single-use cups are targeted



схатрю	e Scheme 4. Tai		any place of purchase (with cartons and cups)
			for paper/cardboard material. As noted above, contamination from mixed material cups could pose a threat to quality of material for reprocessors.
			It is assumed that the increased capture of materials will include an element of material that would otherwise have been littered.
			Uncertainties:
			It is unclear at this point if the single-use paper based cups would be transferred to a paper mill or to a dedicated facility. As a problematic waste stream – more so for mixed material single-use cups – it is necessary to have proven technology in place with adequate capacity.
			It is unclear whether all sites will be required to accept all materials or will there be some variability depending on site space restrictions. If there is some variability, consideration will be required on how to communicate to consumers what materials will be accepted at sites which will receive a more limited range of materials.
			It is uncertain whether constraints around storage space will affect separation of collected materials or whether partial co-mingling, e.g. as plastics and cans would be permitted? This could have implications for downstream bulking and sorting infrastructure
			It is not known what waste licensing controls will apply at retail sites receiving returned containers. It is not known if the co- ordinating agency will be responsible for addressing (and funding) these issues, or if obligations fall on receiving retailers (as waste producers).
			It is unclear how the extended reach of the co-ordinating agency to include the public sector will work in practice, and how it will enhance the example scheme.
	Will the DRS increase the economic value and utility of affected materials?		This example scheme can improve the value of the collected materials by providing segregated and clean materials for reprocessors in increased tonnages. The current quantity of contaminated material versus the potential clean material from the example scheme is unknown to validate this judgement. Risks of contamination have been discussed above in this assessment.
Ρ		+/?	Higher volumes of returned materials should generate economies of scale to support investment in local/regional recycling capacity.
			The value of target materials such as coffee cups are not known if used by reprocessors however a ready market exists for use of these materials within recovery services to produce soil additives. It can therefore be confirmed that this example scheme can increase the economy value of the materials targeted.
Р	Will the DRS reduce leakage of material to landfill or energy	++	This example scheme is expected to provide a reduction of recyclable materials incorrectly disposed of to landfill and EfW plants. The expected increase in capture rates demonstrates a justification that the example scheme will support a reduced use

Example	e Scheme 4: Tal	ke back to	any place of purchase (with cartons and cups)				
	recovery or as		of natural assets to develop virgin products.				
	litter?		In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS. It is reasonable to assume that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in upper end of the region of 40-60%.				
			It is expected that capture rates may reach 80% of materials which would mean a reduction in materials in residual waste going to landfill or EfW.				
	Does the DRS have the potential for additional direct or indirect impacts on Material Assets?		It is assumed that the increase in capture rate will include an element of material that would otherwise have been littered; moreso than in example schemes 1-3. This will further benefit the environment in removing physical hazards and sources of contaminants from affecting soil, fauna, flora, beaches and waterways; a position supported by the Marine Conservation Society.				
			The use of localised return points, being any place of purchase, will facilitate residents walking to the return points, however collection of material from the increased numbers of these points and associated vehicle movements and vehicle emissions could affect local air quality.				
S		++/?	If new facilities must be sited, constructed and operated for this example scheme, such as for the reprocessing of single use cups, this could have an effect on the local environment through construction works and/or operations.				
			There will be composition implications for existing infrastructure used to handle and reprocess target materials that might be diverted via the example scheme. Flows of certain materials may also be subject to variations over time, e.g. linked to weather- dependent purchasing patterns and new product promotions.				
			The example scheme may drive greater technology integration between upstream (product manufacture) and downstream (post- consumer management) processes to support material recovery by manufacturers, which is needed to embed Circular Economy principles within industry supply chains.				
	This example schem target materials to I behavioural change tonnage of material target material. Of t contribution to the S	e will allow con RVMs or retaile to facilitate. Th of the example the example sc Scottish Goverr	nsumers in rural and urban locations to return a wide range of ers across the country. It will ensure wide access and require limited his example scheme will lead to the collection of the highest e scheme considered and has the potential to capture up to 80% of heme considered, this example scheme will make the most positive inments waste strategies and targets.				
	Compared to examp scheme which could however, this is offs	ble schemes 1 c be argued ma et by the conve	and 2, there is a lower value deposit associated with this example y affect the motivation for consumers to return items to a retailer; enience of the location of return locations.				
	Capture rates demonstrate a positive impact upon the natural assets and built assets wherein						

Example	e Scheme 4: Take back to any place of purchase (with cartons and cups)
	recyclate materials will be collected for reuse.
	The example scheme may drive greater technology integration between upstream (product manufacture) and downstream (post-consumer management) processes, which is needed to embed Circular Economy principles within industry supply chains.
	The example scheme will use RVMs, in combination with manual take back methods; and the schemes long term success will in part depend on the technology selection, its reliability and the avoidance of redundancy.
	Given the increased collection tonnages and materials to be collected in this example scheme, consideration may need to be given to the capacity of the existing reprocessors to accommodate the increased material.
	The example scheme will have a positive impact upon litter with anticipated reductions of litter from terrestrial and marine environments.
	This example scheme provides the strongest opportunity to contribute toward Scottish waste and environmental aspirations. The scheme offers an accessible service that can be deployed in urban and rural areas; ensuring a national service.

4.4 Mitigation and enhancement

Each example scheme demonstrates clear opportunities to minimise the material assets needed to produce drink containers through the effective collection of clean, segregated materials for reprocessing. Each example scheme does, however, have a number of uncertainties, notably in how and where materials will be reprocessed. This section summarises potential mitigation recommendations to be considered broadly across all the example schemes.

Table 4.4	¹ Mitigation	and	enhancement	recommendations
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Example Scheme	Mitigation recommendations		
Example 1: Take back to	Existing infrastructure should be utilised to minimise the need for constructing new facilities.		
dedicated points	If new facilities are required, consideration will need to be given to		
	 Location (and where not close to rural and isolated communities) how these communities will be served; 		
	 For facilities to be located in urban areas, seek to locate the facilities on sites with: 		
	Compatible adjacent land uses;		
	Previously developed land;		
	 Good accessible locations, providing easy access throughout the day and at weekends; 		
	• No evidence of poor air quality;		
	 No environmental constraints (such as being an area of high flood risk, or designated assets or features (such as wildlife sites, cultural heritage sites, listed buildings or water bodies)). 		



Example Scheme	Mitigation recommendations					
	 Design of the infrastructure, seeking to maximise the use of recycled materials. 					
	A study should be undertaken to establish the effects on virgin materials from the use of any example scheme for collected plastic, glass and metals. A mass balance should be undertaken to assess the market effect of increased availability of secondary material against the demand and cost impacts for virgin material; both within Scottish industries and key export markets.					
	Consideration should be granted to the use of RVMs. These raise concerns regarding selection of machines, reliability, downtime, and redundancy.					
	election of machines, reliability, downtime, and redundancy. Dedicated take back points and the counting centre should be carefully located to ninimise vehicle movements both within built up areas and to minimise carbon emissions in operating the DRS. Integration or co-operation between retail supply chains and resource management supply chains would seem beneficial. This example scheme should seek to utilise retail distribution centres that are closely aligned with recycling transfer stations or logistics networks.					
	aligned with recycling transfer stations or logistics networks. Further work should explore the existing capacity of reprocessors in Scotland to manage the materials targeted within this example scheme.					
Example 2: Take back to dedicated points and some shops (with cartons and cups)	 In addition to the summary of example scheme 1 mitigation statements above, consideration should also be granted the following points relevant to example scheme 2: A wider number of return locations will maximise capture rates and will embed a culture and ethos of returning materials for their deposit values however this will lead to increased vehicle movements between the increased number of dedicated take back points, those shops within the scheme and the counting centre or reprocessors. As a solution, smart routing, or reverse logistics, could be used. Dedicated take back points and/or counting centres should be carefully located to minimise vehicle movements both within built up areas and to minimise carbon emissions in operating the DRS. Work should be undertaken to confirm the capacity within reprocessors to manage the expected increase in tonnages of materials as well as the increase in material ranges. It is not clear if there is a suitable market for single-use drink cups in Scotland however small-scale facilities are in place for converting these into soil additive. 					
Example 3: Take back to any place of purchase	In addition to the summary of example schemes 1 and 2 mitigation statements above, consideration should also be granted the following points relevant to example scheme 3:					
	 The locations of counting centres – as well as the routing of collection services - should be carefully modelled to minimise vehicle movements both throughout built up areas and to minimise carbon emissions in operating the DRS. 					
	 Acknowledging constraints around storage space is the expectation that returned containers will be kept separate when collected? Will partial co- mingling, e.g. as plastics and cans are commonly now, or full co-mingling be permitted? This has significant implications for downstream bulking and sorting infrastructure. 					

Example Scheme	Mitigation recommendations
	• It is unclear how the extended reach of the co-ordinating agency to include the public sector will work in practice, and how it will enhance the DRS.
Example 4: Take back to any place of purchase (with cartons and cups)	 There are no additional mitigation points above those outlines in example schemes 1- 3 above.

5. Climatic Factors

This section outlines the assessment of the example schemes against the scoped in topic of climatic factors. Whilst the SEA legislation does not provide any definition of the term "climatic factors", for the purposes of this assessment, the term is concerned with increasing the likelihood of climate change effects through greenhouse gas emissions, and the ability to adapt to the effects of climate change such as the occurrence of more extreme weather events.

The Carbon Impacts of the Circular Economy (2015)⁴³ states that over two thirds of Scotland's' carbon footprint is directly related to material consumption and waste. The contribution of a DRS to Scotland's carbon targets are clear; reducing virgin material demand and recycling containers will reduce the impact of waste operations in Scotland.

This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of each example scheme, regarding climatic factors.

5.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS that are relevant to the climatic factors topic and against which all example schemes have been reviewed are shown in **Figure 5.1** and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

⁴³ Zero Waste Scotland (2015) The Carbon Impacts of the Circular Economy





The relationship between the identified PPSs and the DRS are outlined below.

The United Nations Framework Convention on Climate Change (UNFCCC) sets an overall framework for international action to tackle the challenges posed by climate change. The Convention sets an ultimate objective of stabilising greenhouse gas concentrations "*at a level that would prevent dangerous anthropogenic* (human *induced*) *interference with the climate scheme.*" The Convention requires the development and regular update of greenhouse gas emissions inventories from industrialised countries, with developing countries also being encouraged to carry out inventories. The countries who have ratified the Treaty, known as the Parties to the Convention, agree to take climate change into account in such matters as agriculture, industry, energy, natural resources and where activities involve coastal regions. The Parties also agree to develop national programmes to slow climate change. The two main agreements resulting from the UNFCCC to date are the **Kyoto Protocol (1997)** and the **Paris Agreement (2015)**.

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC). It was adopted on 11 December 1997 to establish an international mechanism to reduce emissions of greenhouse gas emissions and in consequence set binding emissions reduction targets for 37 industrialised countries and the European Community. These targets equated to an average of 5% reductions relative to 1990 levels over the five-year period 2008-12. The key distinction between this and the UNFCCC is that the Convention encourages nations to stabilise greenhouse gases while the Kyoto Protocol committed them to doing so through greenhouse gas reductions. It included three market-based mechanisms to meet these targets: emissions trading; the clean development mechanism (CDM); and Joint Implementation (JI).

The Paris Agreement was adopted by those parties attending COP-21 in December 2015. It was signed by 195 UNFCCC members and at the time of writing has been ratified by 170 of these. Its aim is to keep global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. It discusses the importance of limiting emissions from waste management. The DRS could contribute to limiting emissions from waste management processes related to DRS affected materials both within Scotland and further afield. The main climate change mitigation delivery mechanism is the submission of five year Nationally Determined Contributions (NDCs) by all signatories with a steadily increasing ambition in the long term.



The EU Emissions Trading Scheme (EU ETS) is a Europe wide scheme was introduced in 2005. EU ETS puts a price on carbon that businesses use and creates a market for carbon. It allows countries that have emission units to spare (emissions permitted to them but not "used") to sell this excess capacity to countries which are likely to exceed their own targets. **The Integrated Climate and Energy Package** included a revision and strengthening of the ETS. A single EU-wide cap on emission allowances applied from 2013 and will be cut annually, reducing the number of allowances available to businesses to 21% below the 2005 level in 2020. The free allocation of allowances will be progressively replaced by auctioning, and the sectors and gases covered by the scheme will be somewhat expanded.

European Union (2018): The EU Action Plan for the Circular Economy details an EU Action Plan for the Circular Economy. The Action Plan includes a suite of programmes seeking to embed improved practices across the life cycle of products; from cradle to grave. The wider benefits of adopting a circular economy contribute to helping tackle climate change and lower current GHG emissions levels. The **revised legislative proposals on waste** set clear targets for waste reductions. Key elements of the revised waste proposal include:

- A common EU target for recycling 65% of municipal waste by 2030;
- A common EU target for recycling 75% of packaging waste by 2030;
- A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030;
- A ban on landfilling of separately collected waste; and
- Promotion of economic instruments to discourage landfilling.

The Action Plan sets a context for the DRS in pushing member states to radically enhance waste management and recycling practices; to design out waste and to design products that can be recycled (if not repaired/remanufactured) at end of life. This has led Scotland to explore the opportunity for a DRS so to meet – and exceed – the recycling targets; and to decrease GHG emissions from wastes management.

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The Climate Change (Scotland) Act 2009 sets the statutory framework for GHG emissions reductions in Scotland, with targets for reductions by 80% in 2050, with an interim 2020 target of 42%. These targets are more ambitious than those for the UK as a whole, and the EU. This requires annual targets to be set in batches, and requires an annual report on how the targets will be achieved. Section 84 mentions the potential to establish deposit return schemes in order to meet waste reduction and recycling targets. **The New Climate Change Bill (2018)** will amend the Climate Change (Scotland) Act 2009 to include revised targets for greenhouse gas reductions based on actual emissions, increasing the 2050 target to 90% emissions reduction, and making provisions for a net-zero greenhouse gas emissions target to be set when the evidence becomes available. It includes interim targets of:

- 2020 is at least 56% lower than the baseline;
- 2030 is at least 66% lower than the baseline; and
- 2040 is at least 78% lower than the baseline.

The Climate Change Plan: The Third Report in Proposals and Policies 2018-

2032 is the third Report on Proposals and Policies (RPP) to be produced by Scottish Government. It sets out details of the approach to cutting emissions up 2032. It states targets to recycle 70% of all waste by 2025, reduce waste sent to landfill to 5% by 2025, and establish a more circular economy, where goods and materials are kept in use for longer. It mentions the intention to introduce a DRS



improve both the quantity and quality of recycling of the materials collected.



Scottish Government (2017): The Scottish Government Programme for Scotland states the Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The programme commits the government to develop a DRS for drink containers across Scotland; to reduce the demand for virgin containers and promote capture and recycling of existing material. The programme seeks to increase recycling rates and reduce littering by examining how to reduce demand for single-use containers including development of an advisory group exploring fiscal options to reduce waste and boost the circular economy

Scottish Government (2014): The Scottish National Planning Framework

(NPF) 3 provides the spatial expression of the Scottish Government's Economic Strategy, and the plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland. The framework recognises that the design of places can minimise waste whilst instilling responsible behaviours in providing waste infrastructure for public use. Planning will play a key role in delivering on the commitments for Scotland to a low carbon place and the priorities identified in the NPF set a clear direction travel which is consistent with their climate change legislation.



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The Scottish Energy Strategy (2017) sets out the Scottish Government's vision for the future energy scheme in Scotland. The Strategy describes how the Scottish Government will strengthen the development of local energy, protect and empower consumers, and support Scotland's climate change ambitions while tackling poor energy provision. In order to achieve Scottish Government climate goals, progress is needed to decarbonise electricity production and heat across all sectors, as well as transport.

Cleaner Air for Scotland: The Road to a Healthier Future (2015) sets out the Scottish Government and its partner organisations aim to achieve further reduction in air pollution in Scotland. As Scotland reduces greenhouse gas emissions and increases the provision of renewable energy, this will provide cobenefits for air quality. Commitments to decarbonise the Scottish economy, including the waste management sector will help reduce air pollution, but choices on how this will be achieved will influence the scale of additional improvements for air quality. The introduction of a DRS will help reduce Scotland's greenhouse gas emissions and could provide co-benefits to air quality.



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Many Scottish Local Authorities have developed a range of local, tailored climate change or sustainability strategies which set out the Authority's ambitions to reduce the impact of climate. Many incorporate more effective resource management including; reducing waste going to landfill, increasing recycling and increasing public awareness of the contribution that waste makes to climate change.

5.2 **Baseline Characteristics**

Climate Change 5.2.1

Predictions of the effects of climate change have been well documented⁴⁴, and many studies, such as the Handbook of Climate Trends Across Scotland produced by Sniffer⁴⁵ show that these effects are already being felt in Scotland. While the extent of the effects of a changing climate is expected to vary by location, there is significant evidence to support the belief that significant changes in precipitation, snowfall, seasonality, cloud cover, humidity, wind speeds, soil moisture, rising sea levels and extreme weather may occur⁴⁶. The UK Climate Change Risk Assessment (CCRA) predicts more frequent flooding arising from more frequent and intense rainfall and an increase in drought incidents during drier summers in the UK. Flooding and coastal change risks are posing the highest risk to the UK. Additional risks which are specifically highlighted as needing more action include efforts to reduce the risks to habitats and species, risks to soils and risks to agriculture and wildlife. Scotland is expected to see more extreme weather events such as more extended hot periods, increases in maximum temperatures nationwide, and fewer days of snow and frost. Longer periods of dry weather in the summer are expected and the wettest days of the year are likely to be considerably wetter than those at present⁴⁷.

Clear links between a changing climate and impacts on the natural environmental and natural resources have been identified and documented. For example, potential effects on biodiversity, flora and fauna, water, air and soil quality are often cited. Alongside this, there is the potential for indirect or secondary effects on other environmental receptors and on communities, businesses and industry. For example, the potential for impacts on water quality from increased flood potential, and the potential for increased pressures on biodiversity through predicted increases in temperature.

The significant climate change impacts of material consumption and waste, along with the critical mitigating impact of resource efficient, circular economy policies have been firmly established in academic literature. Zero Waste Scotland's report The Carbon Impacts of the Circular Economy (2015)⁴⁸ estimates that over two thirds of Scotland's carbon footprint are directly related to material consumption and, to a lesser extent, waste.

⁴⁴ UK Government (2009), UK Climate Projections (UKCP09)

⁴⁵ Sniffer (2006) A Handbook of Climate Trends Across Scotland. Available at: http://www.climatetrendshandbook.adaptationscotland.org.uk/

IPCC (2014) Fifth Assessment Report: Climate Change.

⁴⁷ UK Government (2017) UK Climate Change Risk Assessment 2017 (CCRA) Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-riskassess-2017.pdf

Zero Waste Scotland (2015). The Carbon Impacts of the Circular Economy. Available online at: https://www.zerowastescotland.org.uk/sites/default/files/CIoCE%20Technical%20Report%20-%20FINAL%20-%2015.06.15.pdf

5.2.2 Carbon Emissions

*Scottish Greenhouse Gas Emissions 2015*⁴⁹ provides the latest estimates of greenhouse gas emissions in Scotland for the years 1990 to 2015 and also provides information on the nation's performance against emissions reduction targets set under the Climate Change (Scotland) Act 2009. This publication notes that in 2015, Scottish source emissions of the basket of greenhouse gases are estimated to be 48.1 million tonnes carbon dioxide equivalent (MtCO2e). This is 3.0 per cent lower than the 2014 figure of 49.5 MtCO2e, a 1.5 MtCO2e decrease. The main contributor to this reduction between 2014 and 2015 was a fall in energy supply emissions (such as power stations) (1.7 MtCO2e; 12.0 per cent reduction)

Carbon emissions from waste management account for only 3% of Scotland's total emissions, due to a sharp reduction since 1990 (when they were 7.5% of Scottish emissions). In 2015, emissions from waste in Scotland decreased by 4% to 1.4 MtCO2e, 75% below 1990 levels. However, the fall in waste emissions has slowed down since 2013.⁵⁰

Scotland's Carbon Metric⁵¹ has been developed to consider the environmental impact of materials and waste through an 'entire-life' approach rather than by focusing on its weight alone. It is a consumption based carbon accounting approach that considers the carbon impacts of products and materials over their entire life cycle regardless of the location of manufacture, use and disposal. The Carbon Metric can also act as a proxy measure for a range of environmental impacts to enable the consideration of how Scotland's waste impacts on the environment at the global level rather than just in Scotland.

Using Scotland's Carbon Metric, the current whole life carbon impacts of DRS affected single-use drink containers from both in-home and outside home sources is **412.4 ktCO2eq**. A breakdown of life carbon for each material type in-home and outside-home⁵² is shown in **Table 5.1** and

	ktCO2eq				
Material	Arisings	Recycled	Incineration	Landfill	Total
Glass drinks containers	143,257	-18,982	0	1,570	125,845
Steel drinks containers	9,721	-2,764	2	10	6,969
Aluminium drinks containers	138,335	-55,994	9	37	82,388
Plastic (PET) drinks containers	87,916	-8,369	1,218	71	80,835
Plastic (HDPE) drinks containers	52,698	-5,017	731	43	48,455
Cartons	7,427	-966	-191	2,202	8,473
Disposable cups	unknown	unknown	unknown	unknown	unknown
Total	439,354	-92,091	1,770	3,932	352,965

Table 5.2.

⁵¹ Zero Waste Scotland (accessed June 2018) *What is the carbon metric*. Available online at: https://www.zerowastescotland.org.uk/content/what-carbon-metric

⁴⁹ Scottish Government (2017). *Scottish Greenhouse Gas Emissions 2015*. Available online at: http://www.gov.scot/Resource/0052/00520839.pdf

⁵⁰ Committee on Climate Change (2017) *Reducing emission in Scotland: 2017 Progress report to Parliament*. Available online at: https://www.theccc.org.uk/wp-content/uploads/2017/09/Reducing-emissions-in-Scotland-2017-Progress-Report-CCC.pdf

⁵² **In-home** refers to containers purchased for use within the home such as milk cartons. **Outside-home** refers to containers purchased and used outside the home such as wine bottles in restaurants, alcoholic drinks in bars etc

Table 5.1 In-home life carbon

			ktCO2eq		
Material	Arisings	Recycled	Incineration	Landfill	Total
Glass drinks containers	143,257	-18,982	0	1,570	125,845
Steel drinks containers	9,721	-2,764	2	10	6,969
Aluminium drinks containers	138,335	-55,994	9	37	82,388
Plastic (PET) drinks containers	87,916	-8,369	1,218	71	80,835
Plastic (HDPE) drinks containers	52,698	-5,017	731	43	48,455
Cartons	7,427	-966	-191	2,202	8,473
Disposable cups	unknown	unknown	unknown	unknown	unknown
Total	439,354	-92,091	1,770	3,932	352,965

Table 5.2 Outside-home life carbon

	ktCO2eq					
Material	Arisings	Recycled	Incineration	Landfill	Total	
Glass drinks containers	25,031	-5,340	0	33	19,724	
Steel drinks containers	115	-37	0	0	79	
Aluminium drinks containers	19,707	-8,140	1	5	11,574	
Plastic (PET) drinks containers	18,661	-1,676	275	16	17,276	
Plastic (HDPE) drinks containers	0	0	0	0	0	
Cartons	174	-6	-7	76	239	
Disposable cups	7,307	-24	-305	3,516	10,494	
Total	70,995	-15,223	-35	3,647	59,385	

The data in Table 5.1 and

	ktCO2eq					
Material	Arisings	Recycled	Incineration	Landfill	Total	
Glass drinks containers	143,257	-18,982	0	1,570	125,845	
Steel drinks containers	9,721	-2,764	2	10	6,969	
Aluminium drinks containers	138,335	-55,994	9	37	82,388	
Plastic (PET) drinks containers	87,916	-8,369	1,218	71	80,835	
Plastic (HDPE) drinks containers	52,698	-5,017	731	43	48,455	
Cartons	7,427	-966	-191	2,202	8,473	
Disposable cups	unknown	unknown	unknown	unknown	unknown	
Total	439,354	-92,091	1,770	3,932	352,965	

Table 5.2 demonstrate that the significant majority of life carbon from target materials are currently from inhome containers. Hence, the strongest potential carbon savings are available should the DRS target insidehome containers.

The (territorial and consumption⁵³) carbon impacts of material flows of DRS affected materials in Scotland in 2012 are highlighted in

Table 5.3⁵⁴. The ZWS baseline was developed through collation of tonnage data on material flows for domestic production, imports and exports to quantify Scotland's direct material consumption. The consumption model considers all emissions related to Scottish material consumption, regardless of where in the world those emissions occur. The territorial model considers only those emissions which are generated in Scotland.

The report shows that territorial carbon impacts are significantly less than consumption carbon impacts due to the large proportion of materials imported to Scotland for use. Waste management has a net impact when territorial boundaries are considered but a net saving when consumption impacts are considered. This is because a large proportion of Scotland's waste is exported for recycling.

Table 5.3 Territorial and consumption carbon impact of material flows

Material type	<i>Territorial</i> carbon impact of material consumption (ktCO2eq)	<i>Consumption</i> carbon impact of material consumption (ktCO2eq)
Glass	262,481	278,607
Ferrous metal	90,120	4,832,905
Non-ferrous metals	3,905,041	4,359,157
Mixed metals	460,890	573,926
Plastics	461,604	1,273,328

Source: Zero Waste Scotland (2015) The Carbon Impacts of the Circular Economy Technical Report

5.2.3 **Contribution of sectors such as energy, business and industry**

Greenhouse gas emissions across all sectors are recorded. Comparative emissions from key sectors including energy, agriculture, transport, residential, waste management and forestry from 1990 and 2013 are shown in **Table 5.4⁵⁵** below.

Table 5.4 GHG emissions by sector across Scotland (1990 and 2013).

⁵⁵ Scottish Government (accessed 2018). *Scottish Environmental Statistics Online Index*. Available at: <u>http://www.gov.scot/seso/</u>



⁵³ Territorial accounting incorporates the 'producer responsibility' principle and only considers emissions produced within a region or country. Consumption accounting is based on the idea of 'consumer responsibility'; and includes all emissions resulting from consumption, regardless of where those emissions are generated. (taken from: Zero Waste Scotland (2015) *The Carbon Impacts of the Circular Economy* Technical Report)

⁵⁴ Zero Waste Scotland (2015) *The Carbon Impacts of the Circular Economy* Technical Report. Available at: <u>https://www.zerowastescotland.org.uk/sites/default/files/CIoCE%20Technical%20Report%20-%20FINAL%20-%2015.06.15.pdf</u>

Sum of Scottish emissions and removals in MtCO2e	Energy Supply	Agriculture and Related Land Use	Transport (excluding international aviation and shipping)	Residential	Waste Management	Forestry
1990 Base Year	22.73	16.11	10.64	8.05	9.86	-7.04
2013 year	16.02	12.40	10.53	7.00	2.70	-9.99
Difference	-6.71	-3.72	-0.11	-1.05	-7.16	-2.95

Source: Scottish Environmental Statistics Online Index

Energy supply remains the largest contributor of GHGs to Scotland's' carbon footprint but has seen the second greatest drop in GHG emissions since 1990; surpassed only by the drop of 7.16 MtCO2e in waste sector emissions. Methane emissions demonstrate a similar pattern as shown in **Table 5.5**.

Table 5.5 Methane emissions by sector across Scotland (1990 and 2013)

Sum of Scottish emissions and removals in MtCO2e	Energy Supply	Agriculture and Related Land Use	Transport (excluding international aviation and shipping)	Residential	Waste Management	Forestry
1990 Base Year	1.97	5.60	0.06	0.26	9.72	0.00
2013 year	0.49	4.70	0.00	0.08	2.56	0.00
Difference	-1.48	-0.89	-0.05	-0.18	-7.16	0.00

Source: Scottish Environmental Statistics Online Index

Water 5.2.4

Climate change is already impacting hydrology and water quality across Scotland and it is expected to increase the frequency and intensity of flooding events. Winter precipitation has increased in the north and west by 51% and 45%, and high flow frequencies in western rivers have increased⁵⁶. Additionally, sea level rise has been recorded around the Scottish coastline, with the longest individual record in Aberdeen at a rise of 60mm since 1920⁵⁷.

Likely Evolution of Baseline without the DRS 5.2.5

Climate 5.2.6

UKCP09 provides the following predictions on changes in climate for Scotland in 2080 based on a medium emission scenario with 90% probability:

- 2080 mean winter temperature: a change in temperature from 3.6°C to 4.0°C;
- 2080 mean summer temperature: a change in temperature from 4.9°C to 5.7°C;
- 2080 mean winter precipitation: increases are in the range 25% to 42%; and
- 2080 mean summer precipitation: increases are in the range 1-4%.

Carbon Emissions 527

The New Climate Change Bill sets interim reduction targets for greenhouse gases of:

- 2020 is at least 56% lower than the baseline;
- 2030 is at least 66% lower than the baseline; and
- 2040 is at least 78% lower than the baseline.

Under a business as usual scenario, recycling rates and waste arising per capita are unchanged, but total waste increases with population. If not recycled, 100% of DRS target materials within residual waste will go to



⁵⁶ SEPA (Accessed June 2018) *The effects of climate change*. Online at: https://www.sepa.org.uk/environment/climate-change/the-effects-of-climate-change/#Scotland

SEPA (Accessed June 2018) The effects of climate change. Online at:

https://www.sepa.org.uk/environment/climate-change/the-effects-of-climate-change/#Scotland



As a result, it is projected that waste sector emissions will fall 52% over the lifetime of the 2018 Climate Change Plan⁵⁸ as emissions from energy from waste plants are attributed instead to the energy sector. In the longer term, the Scottish Government aim to deliver emissions reductions through a circular economy approach, including more productive businesses, new markets and reduced reliance on scarce resources.

Under a business as usual scenario, there is also the potential that sectors such as energy, business and industry could make to reduce GHG emissions. For example, the impact of ongoing grid decarbonisation on manufacturing and waste emissions.

5.3 The likely significant environmental effects of the Draft DRS and the reasonable alternatives

The assessment considers the anticipated changes to climatic factors through the DRS and its intervention into the demand for drinks and drink containers, as well as the infrastructure to manage these wastes.

A summary of all material and carbon impact savings from each example scheme is consolidated in **Table NTS 4**.

The example schemes have the capability of providing positive impacts across climatic factors. The assessment questions forming the basis of the **primary tier** and **secondary tier landscape assessment** are shown below:

Tier	Assessment Questions
Primary Tier	Will a Scottish DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?
Secondary tier	Will a Scottish DRS contribute to the reduction of greenhouse gas (GHG) emissions generated outside of Scotland?

The primary tier effects are assessed first. The secondary tier effects follow. The key to each assessment score is shown below.

	++	+	0	-	ł	?
Score Key:	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.						

⁵⁸ The Scottish Government. *Climate Change Plan: The Third Report on Proposals and Policies 2018 – 2013*. Available online at: http://www.gov.scot/Resource/0053/00532096.pdf

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Example Scheme 1: Take back to dedicated points

Materials in sco	pe Plastic (PET), Glass a	ind Metal	
Type of scheme	Take back to dedica	ted points	
Deposit	£0.20		
Capture rate	60%		
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
			Assessment of Effects:
		ill the DRS intribute to the duction of eenhouse gas HG) emissions enerated in Scotland	This example scheme will contribute to the reduction of GHG emissions generated in Scotland. Under the 60% capture rate assumed in this scheme, it is estimated an additional total 1,474kt of material will be diverted from landfill and incineration with associated emissions savings of 2,729ktCO2eq for the period to 2043 with an annual average carbon saving of 109ktCO2eq. This example scheme will continue to support reductions in carbon and GHG emissions within Scotland by diverting materials from incineration through increased recycling.
Ρ	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland		This example scheme could be associated with relatively higher consumer vehicle movements, given the relative low number of return points; however, the effects at this stage have cannot be quantified. The increased vehicle movements will generate increased carbon emissions by consumers and collection vehicles <i>however</i> government plans to phase out petrol and diesel cars by 2032 may have a positive impact upon these GHG emissions over the lifetime of this example scheme and these movements <i>could</i> be mitigated through reduced a need for household collections and street cleaning by local authorities.
	access to the service, particularly in rural or remote communities – which is discussed further in the BRIA ⁵⁹ and within the EQIA ⁶⁰ . People in such communities may need to travel considerably further to use the service. This could lead to inequalities in access, unevenness in service provision and could affect whether the DRS		

⁵⁹ Zero Waste Scotland (2018) DRS BRIA
 ⁶⁰ Zero Waste Scotland (2018) DRS Equality Impact Assessment (interim)



Example Scheme 1: Take back to dedicated points

Mitigations:
Dedicated points should be located as near as possible to consumers to minimise associated transport emissions. This is a concern primarily in rural areas.
As with all example schemes, carbon emissions related to mater transfer (collection of materials at return points by reprocessors

could realise its aim of being a national service.

rial s) may be mitigated to an unknown degree through a reduction in LA waste collection frequencies.

Assumptions:

None.

Uncertainties:

The location of the return points and any associated infrastructure is uncertain at this point. In consequence, estimates associated with additional consumer vehicle movements and material collection and transfer are uncertain. The Scottish Government (2013): Creating Places – A Policy

Statement for Architecture and Place prioritises low carbon design, including first and foremost a 're-use not replace' approach when dealing with the existing built environment; any required infrastructure should utilise existing buildings opposed to the need to construct new facilities.

It is not clear what proportion of virgin material is required to meet Scotland's current demand for drinks containers. As such, it is difficult to assess the extent to which the increased capture of target materials will reduce demand.

In addition to the previous point, it is not known if captured material will be reprocessed within Scotland or exported abroad for reprocessing. It is therefore difficult to assess whether this example scheme will reduce carbon emissions through waste management in Scotland or if this scheme will export materials that then generate GHG emissions abroad.

This example scheme will reduce the demand for virgin material within Scotland. However, it is not possible to determine the impact on Scotland's territorial emissions however we can estimate the global impacts, some of which will occur in Scotland. +/? This example scheme will reduce carbon emissions by 2,729ktCO2eq for the period to 2043 with an annual average carbon saving of 109ktCO2eq.

This example scheme provides an opportunity to reduce GHG emissions in Scotland by increasing the capture rate of target materials. The example can reduce GHG emissions through improved waste management practices if wastes are reprocessed in Scotland. The example will, however, necessitate

Will the DRS

reduction of

Scotland?

S

contribute to the

greenhouse gas

(GHG) emissions

generated outside of



Example Scheme 1: Take back to dedicated points
increased vehicle movements by consumers who wish to travel to dedicated points and recover their deposits. Notably, this example scheme may, depending on the location, number and distribution of collection points affect the extent to which rural and urban communities receive an equal service. It may require additional travel to the nearest dedicated return point.
The impact of collections – by reprocessors – from these dedicated points is unknown however it is expected this will be offset through reductions in local authority waste collects and street cleaning requirements.
In addition, it has not been confirmed whether existing infrastructure will be used or if materials will be reprocessed in Scotland or abroad. As a result, this example scheme may require exporting of wastes to foreign waste management facilities, creating additional GHG emission through travel and processing abroad.
In conclusion, whilst beneficial, this example scheme offers the weakest opportunity of all four schemes to provide a positive impact upon Scotland's GHG emissions.

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

Materials in scope	All Materials						
Type of scheme	Take back to dedi	Take back to dedicated points and some shops (with cartons and cups)					
Deposit	£0.20						
Capture rate	70%						
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary				
Ρ	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland	++/?	Assessment of Effects: This example scheme will contribute to the reduction of GHG emissions generated in Scotland. Under the 70% capture rate anticipated in this example scheme, it is estimated that a total of 2,072kt of material will be diverted from landfill and incineration with associated emissions savings of 3,612 ktCO2eq for the period until 2043 with an annual average saving of 144ktCO2eq. The wider range of target materials will provide a further reduction of 883ktCO2eq of GHG above Example 1 until 2043 - through the increased range of materials and improved convenience of the				

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

			service.
			This example scheme will continue to support reductions in carbon and GHG emissions within Scotland by diverting materials from incineration through increased recycling.
			Example scheme 2 could be associated with higher consumer vehicle movements, given the relative low number of return points (compared to Examples 3 and 4); however, the effects at this stage have not been quantified. The increased vehicle movements will generate increased carbon emissions <i>however</i> government plans to phase out petrol and diesel cars by 2032 may have a positive impact upon these GHG emissions over the lifetime of this example scheme. These movements could be offset by reduced household collections, and street cleaning services, needed by local authorities as a result of the increased capture of materials through the DRS.
			The distribution and location of dedicated points could affect access to the service, particularly in rural or remote communities (discussed further in the BRIA ⁶¹ and within the EQIA ⁶² .). People in such communities may need to travel considerably further to use the service (than for Examples 3 and 4). This could lead to inequalities in access, unevenness in service provision and could affect whether the example scheme could realise its aim of being a national service.
			Mitigations:
			Dedicated points and participating shops should be located as near to consumers so to minimise vehicle movements to recover deposits. This is a particular concern in rural areas.
			As with all example scheme, carbon emissions related to material transfer (collection of materials at return points by reprocessors) may be mitigated to an unknown degree through a reduction in LA waste collection frequencies.
			Assumptions:
			None.
			Uncertainties:
			The uncertainties associated with this example scheme are similar to those in example scheme 1; there are no further uncertainties to highlight.
S	Wil the DRS contribute to the reduction	+/?	This example scheme will reduce the demand for virgin material within Scotland. However, it is not possible to determine the impact on Scotland's territorial emissions however we can

⁶¹ Zero Waste Scotland (2018) DRS BRIA
 ⁶² Zero Waste Scotland (2018) DRS Equality Impact Assessment (interim)



Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

of greenhouse gas (GHG) emissions generated outside of Scotland?		estimate the global impacts, some of which will occur in Scotland. This example scheme will reduce carbon emissions by 3,612 ktCO2eq with an annual average saving of 144ktCO2eq.	
This example scheme provides an opportunity to reduce GHG emissions in Scotland. The increased number and location of collection points will improve participation and convenience to users. This example scheme will, however, necessitate increased vehicle movements by consumers who wish to travel to dedicated points and participating shops to recover their deposits. The expected tonnages of carbon emissions from the collection of materials by reprocessors is also not known.			
As per example scheme 1, it has not been confirmed whether materials will be reprocessed in Scotland or abroad – or is new infrastructure will require to be constructed. As a result, this example may require exporting of wastes to foreign waste management facilities, creating additional GHG emission through travel and processing abroad however this will include use of cargo shipping with negligible carbon impacts.			
In conclusion, whilst this example scheme will have a beneficial effect on Scotland's GHG emissions, there remains scope for further reductions through Examples 3 and 4.			

Example Scheme 3: Take back to any place of purchase

Materials in scope Type of scheme Deposit Capture rate	Plastic (PET), Glas Take back to any £0.10 80%	s and Metal place of purchase	
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in	++/?	Assessment of Effects: This example scheme will contribute to the reduction capture GHG emissions generated in Scotland. Under the 80% capture rate assumed in this scheme, it is estimated that a total of 1,970kt of material will be diverted from landfill and incineration with associated emissions savings of 3,644ktCO2eq for the period until

	Scotland	u	2043, with an annual average saving of 146ktCO2eq.
			This example scheme will continue to support reductions in carbon and GHG emissions within Scotland by diverting materials from incineration through increased recycling.
			When in operation, this example scheme will limit the additional travel required by consumers (as it is assumed that journeys will be combined with the trip to the retailer). However, movements of materials from these retailers to bulking centres or counting centres could lead to an increase in additional carbon emissions, due to the significant increase in return points (when compared to Examples 1 and 2). These movements could be offset by reduced household collections, and street cleaning services, needed by local authorities as a result of the increased capture of materials through the DRS.
			Mitigations:
			Retailers should explore the opportunity to utilise back-hauling or reverse logistics when taking collected materials to bulking centres or counting centres. This will help minimise the GHG emissions from operating this example scheme.
			Any carbon emissions related to material transfer may be mitigated to an unknown degree through a reduction in LA waste collection frequencies and reduced litter/street cleaning costs.
			Assumptions:
			None.
			Uncertainties:
			The additional carbon emissions associated with the collection and transfer of the DRS materials to counting/bulking centres is uncertain at this stage.
			The remaining uncertainties associated with this example scheme are similar to those in example scheme 1; there are no further uncertainties to highlight.
S	Wil the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated outside of Scotland?	+/?	This example scheme will reduce the demand for virgin material within Scotland. However, it is not possible to determine the impact on Scotland's territorial emissions however we can estimate the global impacts, some of which will occur in Scotland. This example scheme will reduce carbon emissions by 3,644ktCO2eq for the period until 2043, with an annual average saving of 146ktCO2eq.
	This example scheme provides an opportunity to reduce GHG emissions in Scotland by offering a wider range of collection points. This increased range of collection points will improve participation and convenience to users.		

Example Scheme 3: Take back to any place of purchase

Example Scheme 3: Take back to any place of purchase
This example scheme will require less vehicle movements (by consumers) than the take back to dedicated points examples. This will therefore provide a lower GHG emission rate through users, than the previous example schemes.
In contrast however, there could be an increase in vehicle movements to collect materials from retailers and transport these to bulking centres or counting centres which could lead to significant GHG emissions. It is recommended that backhauling principles or reverse logistics are considered to minimise GHG emissions of this example scheme. It is anticipated that the reduction of waste collections and street cleaning operations by local authorities could offset this.
In addition, it has not been confirmed whether materials will be reprocessed in Scotland or abroad – or is new infrastructure will require to be constructed. As a result, this example scheme may require exporting of wastes to foreign waste management facilities, creating additional GHG emission through travel and processing abroad however this will include use of cargo shipping with negligible carbon impacts.
This example scheme will have a positive impact upon Scotland's GHG emissions, and is considered (based on aggregate emission figures) to provide greater opportunity for GHG emission reduction than either Take back to dedicated points example.

Example Scheme 4: Take back to any place of purchase (with cartons and cups)

Materials in scope	e All Materials	All Materials			
Type of scheme	Take back to any	Take back to any place of purchase (with cartons and cups)			
Deposit	£0.10	£0.10			
Capture rate	80%	80%			
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary		
Ρ	Will the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland	++/?	Assessment of Effects: This example scheme will contribute to the reduction of GHG emissions generated in Scotland. Under the 80% capture rate assumed in this scheme, it is estimated that a total of 2.370kt of material will be diverted from landfill and incineration with associated emissions savings of 4,131ktCO2eq for the period until 2043 with an annual average saving of 165ktCO2eq. The wider range of target materials will provide a further 487ktCO2eq of GHG savings above the previous example scheme		



Example Scheme 4: Take back to any place of purchase (with cartons and cups)

			and 1,402ktCO2eq savings beyond the Take back to dedicated points example until 2043 - through the increased range of materials and improved convenience of the service.	
			As with example scheme 3, this example scheme will limit the additional travel required by consumers (as it is assumed that journeys will be combined with the trip to the retailer). However, movements of materials from these retailers to bulking centres or counting centres could lead to significant additional carbon emissions. Again, movements could be offset through reduced household collections, and street cleaning services as a result of the increased capture of materials through the DRS.	
			Mitigations:	
			Retailers should explore the opportunity to utilise back-hauling or reverse logistics when taking collected materials to bulking centres or counting centres. This will help minimise the GHG emissions from operating this example scheme.	
			Any carbon emissions related to material transfer may be mitigated to an unknown degree through a reduction in LA waste collection frequencies and reduced litter/street cleaning costs.	
			Assumptions:	
			None.	
			Uncertainties:	
			The uncertainties associated with this example scheme are similar to those in example scheme 3; there are no further uncertainties to highlight.	
S	Wil the DRS contribute to the reduction of greenhouse gas (GHG) emissions generated outside of Scotland?	+/?	This example scheme will reduce the demand for virgin material within Scotland. However, it is not possible to determine the impact on Scotland's territorial emissions however we can estimate the global impacts, some of which will occur in Scotland. This example scheme will reduce carbon emissions by 4,146ktCO2eq for the period until 2043 with an annual average saving of 159ktCO2eq.	
	This example schem widest range of colle and convenience to	e provides an o ection points. T users.	opportunity to reduce GHG emissions in Scotland by offering the This increased range of collection points will improve participation	
	This example scheme also targets the widest range of materials; providing a convenient service to users.			
	The example scheme will require less vehicle movements (by consumers) than the take back to dedicated points example schemes 1 and 2. This will therefore provide a lower GHG emission rate through users, than the previous example.			
	In contrast however, there could be an increase in vehicle movements to collect materials from retailers and transport these to bulking centres or counting centres which could lead to significant GHG emissions. It is recommended that backhauling principles or reverse logistics are considered to			





minimise GHG emissions of the example scheme.

In addition, it has not been confirmed whether materials will be reprocessed in Scotland or abroad – or if new infrastructure will require to be constructed. As a result, this example may require exporting of wastes to foreign waste management facilities, creating additional GHG emission through travel and processing abroad however this will include use of cargo shipping with negligible carbon impacts.

This example scheme will have a positive impact upon Scotland's GHG emissions, and is considered (based on aggregate emission figures) to provide the most significant opportunity for GHG emission reduction of the four example schemes considered.

5.4 Mitigation and enhancement

Each of the four example schemes demonstrate clear opportunities to reduce GHG emissions, however each poses its own set of potential risks. This section summarises potential mitigation recommendations to be considered broadly across all four example schemes.

Table 5.6 Mitigation and enhancement recommendations

Example Scheme	Mitigation recommendations			
Example 1: Take back to dedicated points	Dedicated take back points should be located as near to consumers so to minimise vehicle movements to recover deposits. This is a particular concern in rural areas.			
	Materials should be reprocessed in as much as possible within Scotland so to minimise the carbon emitted through movement of materials abroad and make use of Scotland's world-leading low carbon electricity grid in energy- intensive reprocessing activities.			
	Local Authorities should monitor how DRS affects waste service demand and reduce their collection frequency where possible; this will provide carbon savings as a result of the example scheme.			
Example 2: Take back to dedicated points and some shops (with cartons and cups)	The mitigation recommendations for this example scheme are similar to those of example scheme 1 above.			
Example 3: Take back to any place of purchase	The mitigation recommendations for this example scheme are similar to those of example scheme 1 above however retailers should explore the opportunity to utilise back-hauling or reverse logistics when taking collected materials to bulking centres or counting centres. This will help minimise the GHG emissions from operating this example scheme.			
Example 4: Take back to	The mitigation recommendations for this example are similar to those of			

Example Scheme	Mitigation recommendations			
any place of purchase (with cartons and cups)	example scheme 3 above.			

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6. Landscape and Visual Impacts

This section outlines the assessment of the example schemes against the scoped in topic of landscape and visual impacts. Whilst the SEA legislation does not provide any definition of the term "landscape" or "visual impacts", Scottish Natural Heritage⁶³ quote the definition of the European Landscape Convention in defining landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".

This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of each example scheme, regarding landscape impacts.

6.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS that are relevant to the landscape and visual impact topic that have been reviewed to inform the assessment of each example scheme are shown in



⁶³ Scottish Natural Heritage (accessed 29-5-18), *Landscape Considerations in Strategic Environmental Assessment*. Available at: <u>https://www.nature.scot/sites/default/files/2017-09/Guidance%20-%20Strategic%20Environmental%20Assessment%20%20-</u> <u>%20Landscape%20Considerations.pdf</u>



Figure 6.1 and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.





The relationship between the identified PPS and the DRS are outlined below.

The European Landscape Convention (2006) seeks to promote the protection and management of urban and rural spaces. The ELC promotes the principles of developing and protecting landscapes through implementation of Landscape Quality Objectives requiring authorities to support public aspirations for their surroundings opposed to solely expert opinion. These require education and training for the public at all levels; from school level to wider public awareness on the importance of landscapes to communities. The principles of the ELC are supported by the DRS wherein the DRS supports the diversion of wastes and litter from local landscapes, whilst simultaneously educating residents on improved litter management. The ELC was adopted by the UK in 2006 however the Scottish Government are satisfied that "existing legislation and administrative schemes for land use planning and environmental management provide appropriate means for meeting the obligations and objectives set out in the ELC".



UK Government (1990): The Environmental Protection Act seeks to improve resource use and environmental conditions through the control of waste collections and management across the UK. The Act provides specific attention to landscapes through control of wastes on land, contaminated land and litter. The Act prohibits unauthorised or harmful deposit, storage or treatment of hazardous wastes on any landscapes without license. The act stipulates that local authorities should inspect their lands and that contaminated lands should be remediated. The act ensures that dropping litter is an offence and provides for fixed fee penalties to be issued to offenders. The DRS supports the ambitions of the act in ensuring wastes management operations are controlled with no harmful impact on local environments, and that littering is an offence which will minimise the diminishment of local sites.





Scottish Government (2017): The Scottish Government Programme for

Scotland states the Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The programme commits the government to develop a deposit return scheme for drink containers across Scotland; to reduce the demand for virgin containers and promote capture and recycling of existing material. The programme seeks to increase recycling rates and reduce littering by examining how to reduce demand for single-use containers including development of an advisory group exploring fiscal options to reduce waste and boost the circular economy. The programme will commit £500,000 to address litter sinks around the coast and to develop policy which



addresses marine plastics. The programme will also invest in creating 10,000 hectares of woodland per annum. The Programme aims to improve tourism across Scotland for coastal and tourism activities and will develop Low Emission Zones; the DRS supports these aims in preserving the local landscape for visitor enjoyment.



The Scottish Natural Heritage Statement (2005): The Landscape Policy Framework (Policy Statement No. 05/01) sets out Scottish Natural Heritage (SNH) approach on conserving and managing Scottish landscapes within government policy. The document emphasises the importance of landscapes across Scotland; to individual well-being and the economic success of an area. The document reiterates the remit of SNH to preserve the aesthetics and natural qualities whilst protecting wildlife and natural schemes. Key actions of SNH include developing a sense of responsibility for landscapes across Scotland whilst acting as statutory consultee to ensure landscape interests are considered in decision making. The DRS supports these ambitions in reducing litter across Scottish landscapes and in nurturing a new behavioural paradigm of improved resource management.

Scottish Government (2014): A Marine Litter Strategy for Scotland identified five proposed strategic directions to reach a Zero Waste Scotland, supported by responsible behaviours. The strategy seeks to address litter within the marine environment between 2013 and 2020. The objectives of the strategy are to enhance current legislation to promote effective clean-up of contaminated areas, whilst supporting local and national stakeholders to understand, and support, litter free urban areas. The strategy seeks to reduce the litter entering the marine environment, by educating visitors to reduce littering and promote recycling of wastes with ZWS (both onshore and offshore – such as fish nets), incentivising better harbourside recycling infrastructure and behaviour changes, improving monitoring protocols and recording mechanisms, in conjunction with local stakeholders. This strategy complements the DRS in pushing for greater recycling through awareness and improved infrastructure; A DRS would therefore support the drive to reduce littering in a marine environment.

 Attrine Scotland



Scottish Government (2014): Toward a Litter free Scotland - The National

Litter Strategy sets clear actions which have an impact upon material assets, when seeking to improve the environment through targeted approaches to litter



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management, through access to improved recycling opportunities, improved product design, awareness campaigns and targeted exploration to tackle litter on beaches. The strategy also proposes exploring enforcement opportunities and identifying pilot solutions to litter. The DRS will support delivery of these actions and ambitions by incentivising recycling of material that would otherwise be littered.

Scottish Government (2014): The Scottish National Planning Framework and Scottish Planning Policy are two documents which promote waste as a resource. The framework and the planning policy recognise that the design of places can minimise waste whilst instilling responsible behaviours in providing waste infrastructure for public use. The Framework encourages planners to revitalise vacant and derelict land in the cities using both Ravenscraig and Dundee waterfront as examples of bringing derelict land back into popular, public, use.



The Framework promotes the protection of Scottish

lands from productive soils, to water resources and the natural landscapes. The Framework reiterates the principles of the Land Use Strategy to make the most of Scottish assets and to take into account the costs arising from poor planning decisions. The framework also discusses the Government's plans to deliver 100,000 hectares of new woodland – 100M trees by 2015. Of particular note the planning policy (para 176) supports "the emergence of a diverse range of new technologies and investment opportunities to secure economic value from secondary resources, including reuse, refurbishment, remanufacturing and reprocessing" whilst noting that the planning scheme should "help deliver infrastructure at appropriate locations, prioritising development in line with the waste hierarchy: waste prevention, reuse, recycling, energy recovery and waste disposal".

The framework encourages residents and local communities to have a say in local planning applications that impact upon local landscapes.

Scottish Government (2016): Getting the best from our land - A land use strategy for Scotland 2016-2021 had the objectives of: land-based businesses working with nature; responsible stewardship of Scotland's natural resources; and urban and rural communities better connected to the land. The vision, objectives and principles of the strategy were retained and built upon by the second land use strategy (published 2016) which covers the period 2016 – 2021. The strategy supports sustainable use of natural assets including DRS target items (and their component ingredients) which can be conserved through effective capture and recycling of materials



The Scottish Government (2013): Creating Places – A Policy Statement for

Architecture and Place for Scotland contains 6 policies that set out the Scottish Government's position on architecture and place. The policies seek to ensure that the value of architecture and places is recognised in the planning process and that high design standards are adhered to. The policies also prioritise low carbon





design, including first and foremost a 're-use not replace' approach when dealing with the existing built environment.

Planning Advice Note 60 (PAN60): Planning for Natural Heritage provides guidance on how development and the planning scheme can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourages developers and planning authorities to be positive and creative in addressing natural heritage issues.

6.2 Baseline Characteristics

This section of the Environmental Report identifies and characterises current environmental baseline conditions for landscape and visual impacts. This baseline highlights the diverse nature of Scotland's landscapes. It also identifies the terrestrial and marine litter levels for targeted DRS materials, and the impact litter has on communities and local environments.

6.2.1 Landscape (including townscapes and built heritage)

Scottish Natural Heritage identified a series of Natural Heritage Zones as part of their Natural Heritage Futures initiative, and used these areas to describe a vision for sustainable use of local natural heritage. A total of 21 zones were identified⁶⁴, each having their own identity resulting from the interaction of geology, landforms, wildlife and land use.

Scotland has 40 National Scenic Areas (NSAs) covering more than one million hectares (12.7% of Scotland). The Planning etc. (Scotland) Act 2006 gives a statutory basis to NSAs. The purpose of the NSA designation is both to identify Scotland's finest scenery and to ensure it is protected from inappropriate development. This is achieved through the local authority planning scheme⁶⁵. Other areas designated for their landscape include two National Parks and three Regional Parks together with a number of Special (local) Landscape Areas⁶⁶.

There are six World Heritage Sites in Scotland: The Forth Bridge, St. Kilda; Old and New Towns of Edinburgh; the Frontiers of the Roman Empire; Heart of Neolithic Orkney; and New Lanark⁶⁷.

The Scottish Government's third National Planning Framework, published in June 2014, recognises wild land as a "nationally important asset", and indicates Scotland's wildest landscapes merit strong protection. Scottish Natural Heritage published a new map of wild land areas in June 2014⁶⁸. 'Wildness' in this context depends on four physical attributes, namely: the perceived naturalness of the land cover; the ruggedness of the terrain which is therefore difficult to cross; remoteness from public roads or ferries; and the visible lack of buildings, roads, pylons and other modern artefacts. There are approximately 8,238 scheduled monuments in excess of 47,000 listed buildings and in excess of 600 conservation areas⁶⁹.



⁶⁴ Scottish Natural Heritage (2002) Natural Heritage Zones: A National Assessment of Scottish Landscapes. Available online at: <u>http://www.snh.org.uk/futures/Data/pdfdocs/LANDSCAPES.pdf</u>

⁶⁵ Scottish Natural Heritage (2017) *National Scenic Areas*. Available online at: http://www.scotland.gov.uk/Resource/Doc/1051/0095735.pdf

⁶⁶ The term used for such local landscape designations varies from one local authority to another. For example, they are currently termed "Areas of Great Landscape Value' in Moray, 'Special Landscape Areas' in Dumfries and Galloway, and 'Sensitive Landscape Character Areas' in Ayrshire. However, guidance published by Scottish Natural Heritage and Historic Environment Scotland suggests the name be standardised to Special Landscape Area (SLA)

⁶⁷ UNESCO (2017) Properties inscribed on the World Heritage List for Great Britain and Northern Ireland. Available online at: <u>http://whc.unesco.org/en/statesparties/gb</u>

⁶⁸ Scottish Natural Heritage (2014) *Mapping Scotland's wildness and wild land*. Available online at:

http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/ ⁶⁹ Historic Environment Scotland (2018) *Listing, Scheduling and Designations*. Available online at:



In addition to Scotland's highly valued landscapes, the growth of its industrial cities over the past 200 years has created valued and varied townscapes and cityscapes complemented by built heritage. Scotland has over 400 small towns that are a distinctive feature of the settlement pattern and provide a wide range of facilities; they are the focus for many community activities and contain a significant proportion of Scotland's historic buildings and more than half of the total number of conservation areas. They are also an important element in Scotland's appeal to visitors and potential inward investors⁷⁰.

6.2.2 Litter

Terrestrial Litter

The majority of litter in Scotland is discarded by members of the public, with business and commercial waste each accounting for less than 5% of total litter presence.

There are various methods available for establishing the proportion of various types of waste that comprise the overall waste stream. For example, based on a count of the total number of litter items, drinks containers made up 4.6% of overall litter in 2016. However, when small items, namely cigarettes and gum, are excluded from the count the proportion rises substantially to approximately 31%⁷¹. If instead the total weight of the litter items is measured, drinks containers make up approximately 22% of the waste stream⁷². When litter items are measured by volume, drinks containers comprise approximately 40% of the waste stream⁷³.

Each of these metrics has merits in understanding the composition of the waste stream and the effects that the DRS might have. For example, in order to understand that direct cost savings to Local Authorities from the DRS, the composition of drinks containers in the waste stream by weight is considered to be the most appropriate metric as it is the closest indicator of potential waste processing cost. For assessing the indirect costs of litter, the volume of litter may be the preferable metric as items of a larger size are likely to cause a greater visual intrusion. However, it should be noted that research shows that items considered dangerous/unpleasant may also be key drivers of the public perception of the effect on litter on the local landscape⁷⁴.

A 2016 survey by Keep Scotland Beautiful sought to identify the composition and distribution of litter in Scotland by recording the type and number of littered items in a representative selection of sites and to compare the results to an equivalent survey undertaken in 2014. A total of 120 sites were surveyed, with 30 in Edinburgh, Falkirk, Renfrewshire and Inverness respectively. Whilst all types of litter were recorded, of particular relevance to a DRS are the types of litter items anticipated to be recyclable through a DRS⁷⁵.

Table 6.1 Number of litter items for DRS affected materials

Type of litter	Number of items	% compared to	Number of items per	% compared to
	per 200m ² of hard	overall item count	200m ² of hard	overall item count in
	surfacing in 2014	2014	surfacing in 2016	2016
Drinks cans	116	2%	100	1.8%

http://data.historic-scotland.gov.uk/pls/htmldb/f?p=2300:30:0



⁷⁰ The Scottish Government (1997) *Planning Advice Note 52: Planning in Small Towns*. Available online:

http://www.gov.scot/Publications/1997/04/pan52

⁷¹ Keep Scotland Beautiful (2016) Composition of Litter in Scotland. Available online:

http://www.prgs.org.uk/write/MediaUploads/CompositionOfLitterInScotland.pdf

⁷² Zero Waste Scotland (2013) *Scotland's Litter Problem*. Available at:

https://www.zerowastescotland.org.uk/sites/default/files/Scotland%27s%20Litter%20Problem%20-%20Full%20Final%20Report.pdf

⁷³ Eunomia (2015) A Scottish Deposit Refund System. Available online:

http://www.eunomia.co.uk/reports-tools/a-scottish-deposit-refund-system/

⁷⁴ Zero Waste Scotland (2015) *Public Perceptions and Concerns around Litter*. Available online:

https://www.zerowastescotland.org.uk/sites/default/files/Public%20Perceptions%20and%20Concerns%20around%20Litter%20report.pdf ⁷⁵ Keep Scotland Beautiful (2016) *Composition of Litter in Scotland*. Available online:

http://www.prgs.org.uk/write/MediaUploads/CompositionOfLitterInScotland.pdf
Drinks cups	42	0.8%	27	0.5%
Drinks cartons	35	0.6%	10	0.2%
Plastic bottles	92	1.6%	84	1.5%
Glass bottles	4	0.1%	8	0.1%
Plastic Bottle	21	0.5%	29	0.5%
tops				
TOTAL	318	5.6%	260	4.6%

Source: Keep Scotland Beautiful

Table 6.1 identifies a reduction in 4 of the 6 waste types identified between 2014 and 2016 and that they made up a relatively small proportion of the total item count in 2016 at 4.6%. However, it should be noted that item count alone is of limited value in understanding the effect of litter on a given landscape. For example, a single, much larger item can have a greater effect on the landscape than multiple smaller similar items and item counts do not take into the value and sensitivity of the receiving landscape.

The Keep Scotland Beautiful National Cleanliness Benchmarking Report 2016-17⁷⁶ states that drinks items are generally more visible, but less widespread than other types of litter in Scotland. These items, on average, were observed on more than 39.4% of sites visited in Scotland. In town centres and high-density residential areas, drinks containers were observed on 44.2% and 51.2% of sites respectively. Along roadside verges, especially busy road networks such as motorway and A-class roads, 73.7% had drinks litter.

The Keep Scotland Beautiful survey concludes that when considering all litter types, there was a slight increase in 2016 compared to 2014, however within this figure there was variation both between types of litter, with some showing an increase and others a decrease, and also a variation depending on the type of place, with town centres showing a reduction and residential areas an increase. Without longer term data it is difficult to draw a firm conclusion.

For every 1 tonne of litter collected, it is estimated that DRS affected materials make up approximately one fifth of the Scottish litter composition⁷⁷:

- Plastic bottles: 9%
- Metal cans: 4%
- Packaging glass: 9%

It is important to note that plastic bottles and cans both have a relatively low per item weight and so these percentages are likely to represent a very large number of items.

Public Attitudes Towards Litter Survey work carried out by Zero Waste Scotland⁷⁸ found that:

- 10% of respondents had intentionally dropped litter in the 12 months prior to the survey being carried out;
- 26% of respondents had accidentally dropped litter and left it there in the 12 months prior to the survey being carried out;
- 86% of respondents had seen someone else drop litter (i.e. either intentionally or accidentally).



 ⁷⁶ Keep Scotland Beautiful (2017) National Cleanliness Benchmarking Report. Available at: <u>https://www.keepscotlandbeautiful.org/media/1561096/16_17-leams-benchmarking-report.pdf</u>
 ⁷⁷ Zero Waste Scotland (2013) Scotland's Litter Problem. Available at:

https://www.zerowastescotland.org.uk/sites/default/files/Scotland%27s%20Litter%20Problem%20-%20Full%20Final%20Report.pdf ⁷⁸ Zero Waste Scotland (2016) *Litter*. Available at:

https://www.zerowastescotland.org.uk/sites/default/files/Public%20Attitudes%20and%20Behaviour%20in%20Relation%20to%20Litter%2 0Nov16.pdf



Marine Litter

Alongside terrestrial litter, marine litter also has a negative impact on the economy, environment and society. This includes damage to marine wildlife as well as wider ecosystem deterioration, public health issues and impacts on the aesthetics of Scotland's landscape and a wider range of economic impacts across industries that rely on Scotland's coastal and marine environment.

The Marine Conservation Society Great British Beach Clean 2017⁷⁹ identified that in Scotland beach litter rose by 6% in 2017 compared with 2016 in terms of the number of litter items identified. A total of 57,961 litter items were collected from 111 beaches, averaging of 490 pieces of litter from every 100 metres cleaned, compared to 194 pieces of litter in 2013, an increase of approximately 250% in four years. MCS from the Great British Beach Clean 2015⁸⁰ showed that in 2011 approximately 12 plastic bottles were found per 100 metres cleaned, which reduced to approximately 8 in 2015. However it should be noted that the study pieces of plastic separately and the extent to which these pieces originated from plastic bottles is not known. The effects of marine litter on biodiversity are discussed in **Section 7**.

6.2.3 Likely Evolution of the Baseline without the DRS

Between 1994 and 1999 Scottish Natural Heritage, in partnership with others, commissioned a series of LCA studies that together cover the whole of Scotland. The national suite of LCAs is now over 15 years old. Scottish Natural Heritage is reviewing Scotland's LCA studies, at character type level, to create a single dataset in an interactive digital version to be hosted on the new SNH website. It is understood that by late 2018 the revised LCAs will be available, providing further clarity on the long-term trends⁸¹

In the absence of long term data with regards to littering rates in Scotland, the evolution of the baseline without the DRS is uncertain. There is some evidence that rates of littering may reduce in the long term, in particular for the various types of waste drinks containers but the data is not sufficient to establish this for certain. It should be noted too that this trend data does not directly equate to an effect on the landscape as the data does not identify the sensitivity of the receiving environment.

Data from the Marine Conservation Society identifies a long-term trend of increasing levels of marine litter deposited on beaches, with an increase of approximately 250% over 4 years. However, the limited available evidence shows that the number of plastic bottles (excluding any fragmented pieces of plastic) has been declining. As such plastic bottles may comprise an increasingly small percentage of this litter in terms of numbers of litter items. With regards to litter in the terrestrial environment, the limited trend data available with regards to the amount of litter in the environment cannot be used to directly infer an effect on the landscape as the data does not identify the sensitivity of the environment.

6.3 The likely significant environmental effects of the Draft DRS and the reasonable alternatives

The assessment considers the anticipated changes to the Scottish landscape through the example schemes, with effects arising from changes to materials collected, associated reduced littering and the need for new infrastructure.

The assessment questions forming the basis of the **primary tier** and **secondary tier landscape assessment** are shown below:



⁷⁹ Marine Conservation Society (2017) *Great British Beach Clean Report 2015*. Available at: https://www.mcsuk.org/press/beachwatch-2017-report-scotland

⁸⁰ Marine Conservation Society (2015) *Great British Beach Clean Report 2015*. Available at: https://www.mcsuk.org/downloads/gbbc/2016/487-

^{2016%20}Beachwatch%20GBBC%20Summary%2016pp%20A5%20WEB%20Spreads.pdf ⁸¹ Scottish Natural Heritage (2017) *Landscape Character Assessment*. Available online at: http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/lca/

Tier	Assessment Questions
Primary Tier	Will the DRS reduce littering of material into terrestrial and marine environments?
Secondary tier	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?

The primary tier effects are assessed first. The secondary tier effects follow. The key to each assessment score is shown below.

	++	+	0	-		
Score Key:	Significant	Minor positive	No overall	Minor negative	Significant	Score
	positive effect	effect	effect	effect	negative effect	uncertain

NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.

Exam	ple Scheme [·]	1: Take back to	o dedicated	points

Materials in sco Type of scheme Deposit	pe Plastic (PET), Glass a Take back to dedica £0.20	nd Metal ted points	
Capture rate	60%		
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS reduce littering of material into terrestrial and marine environments?	++/?	Assessment of Effects: This example scheme is anticipated to increase capture rates to 60%. This example scheme will support further reductions in the terrestrial and marine litter tonnages by incentivising consumers to recycle wastes to recoup the financial value. DRS have been implemented in a number of countries worldwide



Example Scheme 1: Take back to dedicated points

and where the effect of these schemes on litter has been reviewed, they have typically identified that a DRS is an effective instrument against littering. A study by the European Commission⁸² reviewed the Dansk Returscheme⁸³ (the Danish DRS), the Norsk Resirk (the Norwegian DRS renamed Infinutum⁸⁴) and a pilot DRS project in the Catalan⁸⁵. The study concluded that whilst the inherent complexity of identifying a direct correlation between the operation of a DRS and littering makes quantifying the effect difficult, those countries operating a DRS show low littering rates of drink packaging. The benefits of a DRS are most apparent in those countries with comparatively low levels of recycling prior to implementation of the DRS.

These findings are supported by a number of other studies. Following on from the Catalan pilot DRS, a further study has estimated a reduction in the littering of drink containers from 1,280 tonnes to 173 tonnes per year if the scheme were to be fully implemented, a reduction of 86%⁸⁶. In the USA eight states legislated for the implementation of a DRS in the 1970/80s, with rates of litter reduction ranging from 30-64%, with the variation in part a reflection of the different methodology employed in studying the effectiveness of the various DRS⁸⁷. A study by Ghent University⁸⁸ that reviewed the effects of DRS in the Netherlands, Germany and Israel concluded that a DRS could be expected to reduce littering by 40%. A study by the European Commission also concluded that a DRS would be beneficial in reducing marine litter; it can therefore be suggested that a DRS will incentivise consumers to change littering behaviour above current recycling practices. The Marine Conservation Society have identified a deposit return scheme as a positive move towards reducing the effects of litter on marine environments.

In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS, it is reasonable to assume that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in lower end of the

⁸⁴ Infinitum continues to operate. Further details are available at: <u>https://infinitum.no/english/contact</u>



⁸² European Commission (2013) Marine Litter study to support the establishment of an initial quantitative headline reduction target. Available at:

http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/final_report.pdf ⁸³ The Dansk Retursystem continues to operate. Further details are available at:

https://www.danskretursystem.dk/en/

⁸⁵ The Catalan Zero Waste Pilot operated in 2013. Further details are available at:

https://zerowasteeurope.eu/2013/04/catalan-zero-waste-network-launches-pilot-bottle-deposit-project-in-cadaques/

⁸⁶ Eunomia (2017) *Plan for Deposit Return Scheme Launched in Catalonia*. Available at:

http://www.eunomia.co.uk/plan-for-deposit-return-scheme-launched-in-catalonia/

⁸⁷ Container Recycling Institute (2016) *Bottle Bill Resource Guide*. Available at:

http://www.bottlebill.org/about/benefits/litter/bbstates.htm

⁸⁸ Ghent University (2016) *Deposit-refund schemes for one-way drink packaging*. Available at: https://lib.ugent.be/fulltxt/RUG01/002/304/845/RUG01-002304845_2016_0001_AC.pdf

	F aranala (· Taka baak (a dadiaa(ad yain(a	
	Example	scheme 1	: Take back to dedicated points	
			region of 30-50%.	
			This example scheme is likely to support achievement towards the lower end of this range given the more restricted range of materials collected, the anticipated number of return points and their locations.	
			In reducing the amount of litter, this example scheme would lead to an improvement in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. However, the design of this example scheme could limit the beneficial effects, as the number of return points is relatively lower than other examples, and may not be situated conveniently to maximise consumer participation.	
			The limited range of materials collected in this example scheme will not address all sources of container litter in the environment.	
			Mitigation:	
			Clear and targeted awareness campaigns at the scheme launch will be essential to ensure target materials are captured and consumers are continued to be encouraged to take responsibility for their litter.	
			Assumptions:	
			None	
			Uncertainties:	
			The location of the returning points is unknown.	
			The magnitude of effect is dependent on the sensitivity of the receiving landscape. As a nationwide plan, the sensitivity of the receiving landscape is not known.	
S	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?	0	The example scheme could require new materials collection infrastructure. It is anticipated that dedicated take back points would be incorporated into an existing facility with a similar function, such as a recycling centre. If a new facility were required, it is anticipated that it would be located in an area of high demand, such as within towns and cities, minimising the potential for an adverse effect.	
			The required counting centre should be located within an existing facility.	
	This example scheme pr environments including	ovides an op high footfall	portunity to reduce litter across the terrestrial and marine areas such as beaches.	
	The more restricted range of accepted containers (when compared to Example 2 and 4) will affect the extent to which litter is reduced, as this example scheme does not include all sources of plastic and paper based containers.			

Example Scheme 1: Take back to dedicated points

The design of the example scheme, with a comparatively lower number of return points may also reduce the number of items diverted due to limited convenience. It is assumed that some consumers will still choose to leave items of litter rather than recognise the value of the container, due to the perceived inaccessibility and inconvenience of travelling to return points. This effect can be amplified in rural locations where the number of return points could be more limited.

It can be concluded that this example scheme is likely to have a positive effect upon littering of material into terrestrial and marine environments. This impact will, however, be to a lesser extent than the alternative example schemes 2, 3 and 4.

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

Materials in scope Type of scheme Deposit Capture rate	All Materials Take back to dedi £0.20 70%	cated points and s	some shops (with cartons and cups)
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS reduce littering of material into terrestrial and marine environments?	++/?	Assessment of Effects: This example scheme is anticipated to increase capture rates to 70%. The example scheme will support further reductions in the terrestrial and marine litter tonnages by incentivising consumers to recycle wastes to recoup the financial value. In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS (see example scheme 1), it is assumed that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in the region of 40-60%. The example scheme is likely to support achievement towards the middle end of this range given the less restricted range of materials collected, the anticipated number of return points and their locations (relative to Example 1). In reducing the amount of litter, this example scheme would lead to an improvement in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. However, the design of this example scheme could (relative to Examples 3 and 4) limit the beneficial effects, as the number of return points is lower, and



Example S	cheme 2: Tak	e back to d	dedicated points and some shops (with cartons and cups)
			may not always be situated conveniently. Mitigation: None Assumptions: None Uncertainties: The magnitude of effect is dependent on the sensitivity of the receiving landscape. As a nationwide plan, the sensitivity of the receiving landscape is not known.
s	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?	0	As expected in example scheme 1, this example scheme may require new materials collection infrastructure such as a counting centre. It is anticipated that there will be a number of dedicated take back points and participating shops. If new facilities were required, it is anticipated that it would be located in an area of high demand, such as within towns and cities, minimising the potential for vehicle movements and adverse effect. The required counting centre should be located within an existing facility.
	This example sch environments ind The wider range more convenient It can be conclud material onto te lesser extent tha	eme provides cluding high fo of accepted co service to use ded that this e rrestrial and n an Examples 3	an opportunity to reduce litter across the terrestrial and marine otfall areas such as beaches. ontainers and increased range of return points will provide a slightly rs. xample scheme is likely to have a positive effect upon littering of narine environments. This impact will, however, be limited; to a and 4.

Example Scheme 3: Take back to any place of purchase



Example Scheme 3: Take back to any place of purchase				
Materials in scopePlastic (PET), Glass and MetalType of schemeTake back to any place of purchaseDeposit£0.10Capture rate80%				
Primary (P) Seconda ry (S)	SEA Criteria	Score	Commentary	
Ρ	Will the DRS reduce littering of material into terrestrial and marine environmen ts?	++	Assessment of Effects: This example scheme is anticipated to increase capture rates to 80% due to the increased convenience offered from the retail collection points. In light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS (see example scheme 1), it is assumed that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in the region of 40-60%. This example scheme is likely to support achievement towards the higher end of this range by providing accessible and conveniently located facilities to return recyclable items to a retail store, which is readily available in many locations, particularly towns and cities. Therefore, this example scheme is anticipated to have a significant positive effect on reducing littering. The more restricted range of materials that would be collected through this example scheme may, however, have a consequence on its effectiveness, particularly in restricting littering of some plastic and paper drinks containers. Mitigation: None. Assumptions: None. Uncertainties: The magnitude of effect is dependent on the sensitivity of the receiving landscape. As a nationwide plan, the sensitivity of the receiving landscape is not known.	
S	Does the DRS have the potential for additional	0	As expected in previous example scheme above, this example scheme would require new materials collection infrastructure including return points, a counting centre and 4 bulking points. Under this example scheme the return facility would be within existing retail premises, or within a car park. In either instance, given the retail use of the site and	





Materials in scope Type of scheme Deposit Capture rate	e All Materials Take back to any £0.10 80%	place of purchase	(with cartons and cups)
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	Will the DRS reduce littering of material into terrestrial and marine environments?	++	Assessment of Effects: This example scheme is anticipated to increase capture rates to 80% due to the increased convenience offered by being able to return containers to any place of purchase. As discussed in the assessments of all example scheme above, in light of the broad range of studies that have identified a reduction in littering as a result of the implementation of a DRS, it is assumed that the operation of this example scheme in Scotland would have a significant effect on litter reduction, conservatively anticipated to be in the upper region of 40-60%. This example scheme is likely to support achievement towards the higher end of this range by providing accessible and conveniently located facilities to return a fuller range of drink containers/target recyclable items to any place of purchase. Therefore, this example scheme is anticipated to have a significant positive effect on

Example	e Scheme 4: Tal	ke back to	any place of purchase (with cartons and cups)	
			reducing littering.	
			In reducing the amount of litter, this example scheme would lead to a significant improvement in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas.	
			Mitigation:	
			None.	
			Assumptions:	
			None.	
			Uncertainties:	
			The magnitude of effect is dependent on the sensitivity of the receiving landscape. As a nationwide plan, the sensitivity of the receiving landscape is not known.	
S	Does the DRS have the potential for additional direct or indirect impacts on Landscape and Visual Impacts?	0	As expected in previous example scheme above, this example scheme would require new materials collection infrastructure including return points, a counting centre and 4 bulking sites. Under this example scheme the return facility would be within existing retail premises or within a retailers car park. In either instance, given the retail use of the site and the potential for the design of the return facility to be incorporated sympathetically in to the local environment, it is considered that the location of a return facility would have a negligible effect on the local landscape.	
	This example schem environments incluc The wider range of a <u>significantly more a</u>	e provides an o ling high footfo accepted conta <u>ccessible</u> servio	opportunity to reduce litter across the terrestrial and marine all areas such as beaches. iners and increased range of convenient return points will provide a se to users.	
	It can be concluded that this example scheme is likely to have a positive effect upon littering of material onto terrestrial and marine environments. This example scheme will provide the strongest benefits to litter reduction efforts across terrestrial and marine environments.			

6.4 Mitigation and enhancement

Each example scheme demonstrates clear opportunities to minimise the landscape and townscape impacts. This section summarises potential mitigation recommendations to be considered broadly across all examples schemes.

Table 6.2 Mitigation and enhancement recommendations

Example Scheme

Mitigation recommendations

Example Scheme	Mitigation recommendations
Example 1: Take back to dedicated points	Clear and focussed awareness raising materials for a DRS based on this example scheme would be required to ensure consumers understand which materials will be collected. For those materials not included in the example scheme, consumers should continue to be encouraged to take responsibility for litter.
Example 2: Take back to dedicated points and some shops (with cartons and cups)	No additional mitigation measures identified to that for example scheme 1.
Example 3: Take back to any place of purchase	No additional mitigation measures identified to that for example scheme 1.
Example 4: Take back to any place of purchase (with cartons and cups)	No additional mitigation measures identified to that for example scheme 1.

7. Biodiversity

This section outlines the assessment of the example schemes against the scoped in topic of biodiversity. Whilst the SEA legislation does not provide any definition of the term "biodiversity" Scottish Natural Heritage⁸⁹ defines biodiversity as" all living things; the plants, animals and insects in our forests, mountains, rivers, seas, gardens and parks, right down to the things living in our soils".

This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of each example scheme, regarding biodiversity impacts.

7.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS that are relevant to the landscape and visual impact topic that have been reviewed to inform the assessment of each example scheme are shown in Error! Not a valid bookmark self-reference. and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.



⁸⁹ Scottish Natural Heritage (undated) *Biodiversity and Geodiversity Considerations in Strategic Environmental Assessment*. Available online:

https://www.nature.scot/sites/default/files/2017-09/Guidance%20-%20Strategic%20Environmental%20Assessment%20-%20Biodiversity%20and%20Geodiversity%20Considerations%2005%20Aug%202013.pdf





The relationship between the identified PPSs and the DRS are outlined below.



United Nations (2015): Transforming our World - the 2030 Agenda for Sustainable Development sets out 17 global goals agreed by the United Nations. These goals are embedded within the agenda for 15 years and include commitments to protect the planet through sustainable consumption and sustainable management of resources. The DRS supports the 17 global goals in seeking to embed sustainability and resource minimisation across all sectors of society; from designing places to support sustainable living, to conserving natural assets through limiting damage from litter and contamination. Key sustainable development goals relevant to a DRS include: Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 11: Make cities and human settlements inclusive, safe, resilient and

sustainable;

Goal 12: Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.





European Commission: The EU Water Framework Directive (2000) replaces 7 previous directives and seeks to protect the water habitats in lakes, rivers, groundwater and coastal beaches. The policy aims to restore polluted waterways. The Directive combines a range of Integrated Catchment Management and introduces new ways of protecting and improving bodies of water to maximise the best environmental outcomes. The directive acknowledges the interdependency of waterways and local environs.

The **Habitats Directive (92/43/EEC)** and **Birds Directive (2009/147/EC)** include measures to maintain or restore important natural habitats and species including through the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). These Directives are transposed into British law through a number of regulations and planning policy documents.



UK Government (1990): The Environmental Protection Act seeks to improve resource use and environmental conditions through the control of pollutions from waste collections and management across the UK to protect air, water and land. The Act designates the regime for licensing of waste operations and provides the first definition of "controlled wastes" (*known as Hazardous Wastes in Scotland*). The Act introduces the Duty of Care for producers, carriers, importers and exporters. The Act also introduced criminal offences regarding litter in a bid to reduce littering across the UK. The Act requires the UK to tightly control the movement and handling of wastes.



form the **Scottish Biodiversity Strategy.** The aims of the 2020 challenge are to sustain and enhance the ecosystems on both land and at sea so to maximise benefits to Scotland through natural diversity and economic growth. Progress is measured using the **Scottish Biodiversity Strategy Indicators**. The strategy brings together public bodies (SEPA, SNH, Local Authorities etc) to restore ecosystem health across Scotland. Land use plans will take account of nature and how nature operates so to provide valuable services to communities and the economy – supported by effective data which assesses and monitors local ecosystems. The documents note that air, water and soil quality have declined over the previous 60 years in Scotland. The strategy will encourage environmental accounting within business decision making processes, whilst government will invest in research and investment to explore ways to work *with* nature to reduce natural costs from business.

The biodiversity indicators will provide a focus on the identified areas and will support delivery of the principles by including specific measures to:

- Integrate biodiversity values into national and local development strategies and planning processes.
- The indicators include a requirement for government and businesses to implement plans for sustainable productions and consumption and to keep natural impacts within safe ecological limits.
- By 2020 habitat loss is to be halved to brought as close as possible to zero.
- Fish and invertebrate stocks are to be managed legally and sustainably.
- By 2020, at least 17% of terrestrial and inland water (plus 10% coastal marine areas) are to be conserved and effectively managed.
- By 2020, ecosystems that provide essential services related to water, health, livelihoods etc are to be restored and safeguarded.
- National biodiversity strategies and Action Plans are to be adopted by 2015 (now adopted) by key stakeholders.



Scottish Natural Heritage: The Scotland Biodiversity Progress to 2020 Aichi Targets (2017) demonstrates Scotland's progress toward 20 global targets set by the UN Convention on Biological Diversity. Of the 20 targets Scotland is on track for 7 and showing progress on 12 but requiring action. Only 1 target is at risk; wherein progress is moving away from the target. Of note, Scotland is considered a "world leader" in developing the concept of natural capital and integrating biological values in strategies and policies. In contrast, current indicators show that progress to ensure sustainable consumption and production is lagging, that targets to half habitat loss has slowed and that sustainable management of marine and forestry environments is stagnating.

Scottish Natural Heritage (2010): Scotland's Wildlife – An assessment of

biodiversity in 2010 demonstrates that of 8 priority coastal and marine habitats appraised showed that 38% were recorded as declining, in woodlands, 28% of 31 priority species were declining, assessments on upland species demonstrated declining numbers across the board. Overall, across Scotland, 31% of priority habitats were declining whilst 41% were improving. Overall the assessment reports Scotland is on target for 22 actions as of 2010, with 9 requiring improvement and 6 not on target. In a survey, adults responded positively to questions around biodiversity and an increasing proportion are members of biodiversity NGOs. Scotland's DRS can build upon the positive behaviours of residents to reduce demand for virgin materials and to better protect habitats through reduced littering.





Scottish Executive (2004) Nature Conservation (Scotland) Act

aims to conserve biodiversity and habitats across Scotland. The Act requires public bodies and office-holders to consider the effect of their actions at a local, regional, national and international level through a new general duty. The Act extends the laws surrounding Sites of Special Scientific Interest (SSSIs), of which Scotland now has over 1,400 sites, and wildlife by promoting stewardship of individual species as well as the overarching diversity of the habitats and regulates land management operations.

The Act introduces a framework under which the flora and fauna of Scotland, geological and geomorphological features, can be conserved by designating the land as SSSIs. Police powers are further enhanced to protect wildlife.





Scottish Government (2017) Pollinator Strategy for Scotland is the

Governments strategy to manage the threats to pollinators from land use, habitat fragmentation, disease and pesticide. The strategy aims to "address the causes of decline in populations, diversity and range of our pollinator species and to help them thrive into the future". By 2027, the strategy intends to embed support for pollinators into strategies and policies across the public sector, improve understanding of pollinators and to regulate imports of species to minimise disease The DRS may support the pollinator strategy in preserving habitats and biodiversity through reductions in litter which improve habitat quality.



Pollinator Strategy

Scottish Government (2017): The Scottish Government Programme for Scotland states the



Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The programme commits the government to develop a deposit return scheme for drink containers across Scotland; to reduce the demand for virgin containers and promote capture and recycling of existing material. The programme will commit £500,000 to address litter sinks around the coast and to develop policy which addresses marine plastics. The programme protects Scotland's biodiversity by providing Police Scotland with new resources to tackle wildlife crime, to establish independent groups to manage grouse moors and to explore management of deer populations. The programme will develop the Central Scotland Green Network – Europe's largest greenspace project including 25 pollinator projects.

Scottish Government (2014): A Marine Litter Strategy for Scotland identified five proposed strategic directions to reach a Zero Waste Scotland, supported by responsible behaviours. The issue of marine litter is an important topic in society today with significant efforts being undertaken across businesses and governments to eliminate marine litter; notably plastics wastes. The strategy notes the harm posed to the marine environment from marine litter.

The strategy seeks to address litter within the marine environment between 2013 and 2020. The objectives of the strategy are to enhance current legislation to promote effective clean-up of contaminated areas, whilst supporting local and national stakeholders to understand, and support, litter free urban areas. The strategy seeks to reduce the litter entering the marine environment, by educating visitors to reduce littering and promote recycling of wastes with ZWS (both onshore and offshore – such as fish nets), incentivising better harbourside



recycling infrastructure and behaviour changes, improving monitoring protocols and recording mechanisms, in conjunction with local stakeholders. This strategy complements the DRS in pushing for greater recycling through awareness and improved infrastructure; A DRS would therefore support the drive to reduce damage



across the marine environment.

Scottish Government (2014): Toward a Litter free Scotland - The National Litter Strategy sets clear actions which have an impact upon material assets, when seeking to improve the environment through targeted approaches to litter and fly-tipping. The strategy seeks to educate the public to adopt alternative

in document.





behaviours to waste management, through access to improved recycling opportunities, improved product design, awareness campaigns and targeted exploration to tackle litter on beaches. The strategy also proposes exploring enforcement opportunities and identifying pilot solutions to litter. The DRS will support delivery of these actions and ambitions by incentivising recycling of material that would otherwise be littered.

Scottish Government (2014): The Scottish National Planning Framework and Scottish Planning Policy are two documents which promote waste as a resource. The framework and the planning policy recognise that the design of places can support local ecosystems and habitats. The documents note the importance of peatland habitats as both carbon stores and wildlife habitats. The documents note the importance of the planning scheme in conserving these spaces as well as ensuring a balance in safeguarding spaces whilst facilitating changes in land-deprived areas.



The Framework reiterates the principles of the Land

Use Strategy to make the most of Scottish assets and to take into account the costs arising from poor planning decisions. The framework also discusses the Governments plans to deliver 100,000 hectares of new woodland – 100M trees by 2015.



Scottish Government (2011): The first land use strategy for Scotland, **Getting the best from our land - A land use strategy for Scotland**, had the objectives of: land-based businesses working with nature; responsible stewardship of Scotland's natural resources; and urban and rural communities better connected to the land. The vision, objectives and principles of the strategy were retained and built upon by the second land use strategy (published 2016) which covers the period 2016 – 2021. The strategy notes the declines in biodiversity across Scotland – notably in the agriculture and woodlands industries - and seeks to conserve ecosystems through better use of land including input from communities on local decisions.

Local Biodiversity Action Partnership Plans

Scottish Local Authorities have produced a range of Local Biodiversity Action Partnership Plans, written (in some instances) and supported by interest groups. The plans seek to conserve existing habitats whilst restoring lost or damaged ecosystems. The plans aim to monitor and assess current conditions in each region, whilst identifying – through partnership with local communities – actions to be undertaken to conserve habitats.





7.2 Baseline Characteristics

This section of the Environmental Report identifies and characterises current environmental baseline conditions for biodiversity, flora and fauna. This baseline highlights designated nature conservation sites, for example Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Importance (SSSIs), Ancient Woodlands, Marine Protected Areas and Ramsar Sites. It considers current pollution of terrestrial, coastal and marine environments and the effect this has on these ecosystems, including species and habitats, and their interactions.

Designated Conservation Sites

Designated sites, including Ramsar, SPAs, SACs and SSSI sites protect flora, fauna, geological or physiographical features of outstanding quality in terrestrial and coastal environments. **Figure 7.2** identifies the designated nature conservation areas in Scotland.

Figure 7.2 Map of Nature Conservation Areas in Scotland⁹⁰



Source: The Scottish Government (2016) Key Scottish Environment Statistics

There are also additional areas outwith the area shown on the map (65% of Special Areas of Conservation and 71% of Nature Conservation Marine Protected Areas are located outside the area pictured)⁹¹.



⁹⁰ The Scottish Government (2016) *Key Scottish Environment Statistics*. Available online: <u>https://beta.gov.scot/publications/key-scottish-environment-statistics-2016-9781786525505/pages/11/</u>



- 152 SPAs, covering an area of 1,205,368 hectares (in addition to one site which straddles the border with England and is included under the England section above)⁹²;
- 236 SACs covering an area of 2,289,782 hectares (in addition to three sites that straddle the border with England and is included under the England section above)⁹³;
- 50 Ramsar sites covering a total area of 283,083 hectares (in addition to one site which straddles the border with England and is included under the England section above)⁹⁴; and
- As of February 2014, 1,425 SSSIs covering 1,020,000 hectares or 13% of Scotland⁹⁵.

Figure 7.3 demonstrates the growth of designated areas within Scotland between 1991 and 2016.

Figure 7.3 Designated areas: 1991-2016 (Areas thousand hectares)



In March 2018, 79.9% of natural features on protected nature sites were assessed as being in favourable or unfavourable recovering condition⁹⁶. Figure **7.4** below shows the condition of designated sites from 2005 and 2018⁹⁷. In 2018 this included:

⁹² Joint Nature Conservancy Council (2018) UK Protected Sites. Available online: http://jncc.defra.gov.uk/page-4



⁹¹ The Scottish Government (2016) *Key Scottish Environment Statistics*. Available online: https://beta.gov.scot/publications/key-scottish-environment-statistics-2016-9781786525505/pages/11/

⁹³ Joint Nature Conservation Committee. *Special Areas of Conservation*. Available online: http://incc.dofra.gov.uk/page-23

http://jncc.defra.gov.uk/page-23

⁹⁴ Joint Nature Conservation Committee. *UK Ramsar Sites*. Available online: http://incs.dofra.gouuk/page_1288

http://jncc.defra.gov.uk/page-1388

⁹⁵ Scottish Natural Heritage (2017) Site of Special Scientific Interested. Available online:

http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/sssis/sssi-location/

⁹⁶ Scottish Natural Heritage (2018) *Official Statistics for Protected Sites*. Available online:

 $[\]underline{http://www.snh.gov.uk/publications-data-and-research/official-statistics/official-statis/sites-favourable/linearch/official-statistics/official-statis/sites-favourable/linearch/official-statistics/offic$

- Favourable: 66.2%
- Unfavourable Recovering: 6.4%
- Unfavourable Recovering Due to Management Change: 7.1%



Figure 7.4 Condition of designated sites rom 2005-2018

The reasons for unfavourable conditions are numerous, reflecting the range of sites designated, and include:

- Water Pollution from agriculture/run off;
- Undergrazing;
- Inappropriate scrub control;
- Invasive species;
- Forestry and woodland management;
- Moor burning;
- Water pollution from point discharges;
- Public access/disturbance;
- Coastal squeeze.

Pollution of environments and ecosystems

Drinks containers including disposable coffee cups and plastic drinks bottles account for much of the plastic that ends up in the sea, as these items are lightweight and easily blow into streams and rivers which end up



⁹⁷ Scottish Natural Heritage (2018) *The Proportion of Scotland's Protected Sites in Favourable Condition 2018*. Available online: <u>https://www.nature.scot/sites/default/files/2018-05/2018%20Official%20Statistics%20-%20Protected%20sites%20-</u> <u>%20proportion%20in%20favourable%20condition%231_0.pdf</u>



in the ocean. These can wash up on a distant beach or harm marine animals, polluting both coastal and marine environments and ecosystems. It is estimated that "267 species are affected by marine litter globally of which 86% of all sea turtle species, 44% of seabird species, 43% of marine mammal species are with plastic based litter responsible for the direct or indirect deaths of over one million seabirds, 100,000 marine mammals (including 30,000 seals) and 100,000 turtles globally every year"⁹⁸ through ingestion or entanglement. They cause visible pollution, take centuries to break down and spread toxic chemicals.

When exposed to salt water and ultraviolet light, these items can fragment into "microplastics" small enough to be mistakenly eaten by fish and other marine wildlife⁹⁹. This has knock on effects further up the food chain.

As discussed in section 6: Landscape and Visual Impacts, the Marine Conservation Society Great British Beach Clean 2017¹⁰⁰ identified that in Scotland beach litter rose by 6% in 2017 compared with 2016 in terms of the number of litter items identified. A total of 57,961 litter items were collected from 111 beaches, averaging of 490 pieces of litter from every 100 metres cleaned, compared to 194 pieces of litter in 2013, an increase of approximately 250% in four years. MCS from the Great British Beach Clean 2015¹⁰¹ showed that in 2011 approximately 12 plastic bottles were found per 100 metres cleaned, which reduced to approximately 8 in 2015.

7.2.1 Likely Evolution of the Baseline without the DRS

The annual review of UK Biodiversity Indicators comprises 51 measures, of which 5 are not assessed in the long term and 8 are not assessed in the short term. Of the 46 long-term measures, 20 show an improvement, compared to 11 of the measures that were deteriorating. Of the 43 short term measures, 11 show an improvement, as compared to 12 in decline. Measures that improved or deteriorated in the short term have not necessarily continued to improve or deteriorate respectively in the long term¹⁰².

Measures showing long-term deterioration include: pressure from invasive species reflecting a pattern of continuing or growing threat to biodiversity in the UK; status of UK priority species; birds of the wider countryside and at sea; insects in the wider countryside (butterflies); animal genetic resources and status of pollinating insects.

Some of these measures have continued to deteriorate in the short term, including birds of the wider countryside and at sea and the status of pollinating insects.

In Scotland in 2016¹⁰³,

- 4% of species were increasing (compared to 5% in 2005);
- 23% of species were stable (compared to 24% in 2005);
- 15% of species were fluctuating (compared to 3% in 2005);
- 11% of species were declining (slowing) (compared to 9% in 2005);

³⁹ The Economist (2018) *The Known Unknowns of Plastic Pollution*. Available at: <u>https://www.economist.com/international/2018/03/03/the-known-unknowns-of-plastic-pollution</u>



 ⁹⁸ Scottish Government (2012). *Marine Litter Issues, Impacts and Actions*. Available online at: http://www.gov.scot/Publications/2012/09/6461/4
 ⁹⁹ The Economist (2018) *The Known Unknowns of Plastic Pollution*. Available at:

¹⁰⁰ Marine Conservation Society (2017) *Great British Beach Clean Report 2015*. Available at: <u>https://www.mcsuk.org/press/beachwatch-2017-report-scotland</u>

¹⁰¹ Marine Conservation Society (2015) *Great British Beach Clean Report 2015*. Available at: https://www.mcsuk.org/downloads/gbbc/2016/487-

^{2016%20}Beachwatch%20GBBC%20Summary%2016pp%20A5%20WEB%20Spreads.pdf

¹⁰² Joint Nature Conservation Committee (2017) *UK Biodiversity Indicators 2017*. Available online at: http://jncc.defra.gov.uk/pdf/UKBI_2017.pdf

¹⁰³ The Scottish Government (2016) *Key Scottish Environment Statistics*. Available online: https://beta.gov.scot/publications/key-scottish-environment-statistics-2016-9781786525505/pages/11/



- 7% of species were declining (continuing/accelerating) (compared to 5% in 2005);
- 1% of species were lost (pre BAP publication) (no change since 2005);
- 7% of species showed no clear trend (compared to 8% in 2005); and
- the status of 32% of species was unknown (compared to 42% in 2005).

In the absence of the DRS it is anticipated that these trends would continue, with an increase in the number of sites and areas protected for biodiversity, flora and fauna¹⁰⁴.

7.3 The likely significant environmental effects of the Draft DRS and the reasonable alternatives

The assessment considers the anticipated changes to Scottish biodiversity through the example schemes and its intervention into the demand for drinks and drink containers, as well as the infrastructure to manage these wastes.

A summary of all material and carbon impact savings from each example scheme is consolidated in **Table NTS 4**.

The DRS has the capability of providing positive impacts across Scottish biodiversity and habitats. The assessment questions forming the basis of the **primary tier** and **secondary tier landscape assessment** are shown below:

Tier	Assessment Questions
Primary Tier	 Will the DRS a. protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites? b. support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions? c. help avoid pollution of the terrestrial, coastal and marine environments?
Secondary tier	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?

The primary tier effects are assessed first. The secondary tier effects follow. The key to each assessment score is shown below.

Score Key:	++	+	0	-	-	?
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¹⁰⁴ Joint Nature Conservation Committee (2017) *Protected Areas*. Available online at: <u>http://jncc.defra.gov.uk/page-4241</u>

Significant	Minor positive	No overall	Minor negative	Significant	Score
positive effect	effect	effect	effect	negative effect	uncertain

NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.

Example Scheme 1: Take back to dedicated points

Materials in scope	Plastic (PET), Glass and Metal
Type of scheme	Take back to dedicated points
Deposit	£0.20
Capture rate	60%

Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	1.Will the DRS a. protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	++/?	Assessment of Effects: This example scheme will support protection of designated nature conservation sites by incentivising a reduction in litter to recoup deposit values. The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. With regards to the effects of litter on biodiversity in the marine environment, the relationship is clearly established ¹⁰⁵ . The Scottish Government has undertaken a review into the
			impacts associated with marine litter, which noted in particular that ingestion is one of the main impacts on marine wildlife, which can result from litter entering the marine environment. A study by the European Commission also concluded that a DRS would be beneficial in reducing marine litter. The Marine Conservation Society have identified a DRS as a positive move towards reducing the effects of litter on marine biodiversity ¹⁰⁶ .

 ¹⁰⁵ Kühn S., Bravo Rebolledo E.L., van Franeker J.A. (2015) *Deleterious Effects of Litter on Marine Life*. In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham



¹⁰⁶ Marine Conservation Society (2017) *Deposit Return System*. Available online:

https://www.mcsuk.org/clean-seas/drs

Example Scheme 1: Take back to dedicated points

			However, the level of litter in Scottish coastal waters that may be affected by the introduction of this example scheme is unclear. Research has shown that, based on marine litter washing ashore, litter from fishing and shipping was relatively low compared with litter from recreation and sewage-related debris ¹⁰⁷ .
			A comprehensive range of studies exploring the impact of a DRS upon litter is provided across the assessments in Section 4. The evidence demonstrates that a DRS is typically an effective instrument against littering; however the extent of litter in coastal waters is unknown.
			The more restricted range of accepted containers (when compared to Example 2 and 4) will affect the extent to which litter is reduced, as this example scheme does not include all sources of plastic and paper based containers.
			Overall, this example scheme is considered to have a significant positive benefit for biodiversity; however the extent of litter in coastal waters is unknown.
			Mitigation:
			The location of dedicated take back points must be conveniently located to ensure visitors to fragile habitats are able to conveniently return items to nearby return points.
			Clear and targeted awareness campaigns at the scheme launch will be essential to ensure target materials are captured and consumers are continued to be encouraged to take responsibility for their litter.
			Assumptions:
			None.
			Uncertainties:
			Locations of dedicated take back points are not known at this time.
Ρ	b. support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	++/?	It is anticipated that this example scheme would support terrestrial and marine ecosystems, however for the reasons discussed in the response to part (a), the significance of the effect on marine environments is to some extent uncertain.
Ρ	c. help avoid pollution of the terrestrial, coastal and marine	++/?	It is anticipated that the example scheme would help avoid pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in the response to part A,

¹⁰⁷ K. L. Storrier, D. J. McGlashan, S. Bonellie, and K. Velander (2007) *Beach Litter Deposition at a Selection of Beaches in the Firth of Forth, Scotland*. Journal of Coastal Research: Volume 23, Issue 4: pp. 813 – 822.



Example Scheme 1: Take back to dedicated points					
	environments?		the significance of the effect on marine environments is to some extent uncertain.		
S	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?	0	None.		
	This example scheme will support the protection of ecosystems by incentivising consumers to recycle materials which will lead to benefit to terrestrial and marine habitats and species through reduced littering.				
	The design of the example scheme, with a comparatively lower number of return points and more restricted range of collected materials may reduce the number of items. It is assumed that some consumers will still choose to leave items of litter rather than recognise the value of the container, du to the perceived inaccessibility and inconvenience of travelling to return points. This effect can be amplified in rural locations where the number of return points could be more limited.				
	This DRS can therefore enhancement of terres	be assessed trial, marine	as offering a low level of benefit to the protection and and coastal ecosystems, habitats and biodiversity.		

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

Materials in scope Type of scheme Deposit Capture rate	All Materials Take back to dedic £0.20 70%	ated points and s	ome shops (with cartons and cups)
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	1.Will the DRS a. protect and/or enhance designated nature conservation	++/?	Assessment of Effects: Similar to example scheme 1, this example scheme will support protection of designated nature conservation sites by incentivising a reduction in litter to recoup deposit values – more so than example scheme 1 through the increased range of accepted

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

	sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?		materials. The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. With regards to the effects of litter on biodiversity in the marine environment, the relationship is clearly established ¹⁰⁸ . As discussed in example scheme 1, the Scottish Government, European Commission and Marine Conservation Society have identified a DRS as a positive move towards reducing the effects of litter on terrestrial and marine biodiversity ¹⁰⁹ however the extent
			The wider range of materials and the increased number of return points for this example scheme may increase the positive effects on biodiversity when compared to Example 1.
			Overall, this example scheme is considered to have a significant positive benefit for biodiversity. However, there is limited data on marine litter and the impact that the example scheme may have in that environment.
			Mitigation:
			The location of dedicated take back points must be conveniently located to ensure visitors to fragile habitats are able to conveniently return items to nearby return points.
			Assumptions:
			None.
			Uncertainties:
			Locations of dedicated tack back points and participating shops are not known at this time.
Ρ	b. support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	++/?	It is anticipated that this example scheme would support terrestrial and marine ecosystems, however for the reasons discussed in the response to part (a), the significance of the effect on marine environments is to some extent uncertain.

¹⁰⁸ Kühn S., Bravo Rebolledo E.L., van Franeker J.A. (2015) *Deleterious Effects of Litter on Marine Life*. In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham ¹⁰⁹ Marine Conservation Society (2017) *Deposit Return System*. Available online:



https://www.mcsuk.org/clean-seas/drs

Example Scheme 2: Take back to dedicated points and some shops (with cartons and cups)

Ρ	c. help avoid pollution of the terrestrial, coastal and marine environments?	++/?	It is anticipated that the example scheme would help avoid pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in the response to part A, the significance of the effect on marine environments is to some extent uncertain.	
S	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?	0	None.	
	 This example scheme will support the protection of ecosystems by incentivising consumers to recycle a wider range of materials; to the benefit of marine and terrestrial habitats through reduced littering. This example scheme can therefore be assessed as offering an improved level of benefit to the protection and enhancement of terrestrial, marine and coastal ecosystems, habitats and biodiversity beyond that offered by the previous example scheme. 			

Example Scheme 3: Take back to any place of purchase

Materials in scope Type of scheme Deposit Capture rate	Plastic (PET), Glas Take back to any p £0.10 80%	s and Metal place of purchase	
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary
Ρ	1.Will the DRS a. protect and/or enhance	++/?	Assessment of Effects: This example scheme will support protection of designated nature conservation sites by incentivising a reduction in litter to recoup



Example Scheme 3: Take back to any place of purchase

	designated nature		deposit values. This example scheme will can yield greater benefits
	conservation sites e.g. Special Areas of Conservation, Special Protection		The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter.
Areas, Site Special Scientific Importanc Ancient Woodlanc Marine Protected Areas and Bamsar Si	Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?		With regards to the effects of litter on biodiversity in the marine environment, the relationship is clearly established ¹¹⁰ . As discussed in example scheme 1, the Scottish Government, European Commission and Marine Conservation Society have identified a DRS as a positive move towards reducing the effects of litter on marine biodiversity ¹¹¹ however the extent of litter in coastal waters is unknown.
			The more restricted range of materials that would be collected through this example scheme could, however, have a consequence on its effectiveness, particularly in restricting the effects on reduced littering of some plastic and paper drinks containers (with consequential effects on the terrestrial and marine environment) however the increased range of collection points may improve the convenience for consumers to recycle more and to litter less.
			Overall, this example scheme is considered to have a significant positive benefit for biodiversity. However, there is limited data on marine litter and the impact that the example scheme may have in that environment.
			Mitigation:
			Clear and targeted awareness campaigns at the scheme launch will be essential to ensure target materials are captured and consumers are continued to be encouraged to take responsibility for their litter.
			Assumptions:
			None.
			Uncertainties:
			None
	b. support the protection and enhancement of terrestrial, marine and coastal ecosystems,	++/?	It is anticipated that this example scheme would support terrestrial and marine ecosystems, however for the reasons discussed in the response to part (a), the significance of the effect on marine environments is to some extent uncertain.

¹¹⁰ Kühn S., Bravo Rebolledo E.L., van Franeker J.A. (2015) *Deleterious Effects of Litter on Marine Life.* In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham ¹¹¹ Marine Conservation Society (2017) *Deposit Return System*. Available online:



https://www.mcsuk.org/clean-seas/drs

Example Scheme 3: Take back to any place of purchase				
	including species and habitats, and their interactions?			
	c. help avoid pollution of the terrestrial, coastal and marine environments?	++/?	It is anticipated that the example scheme would help avoid pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in the response to part A, the significance of the effect on marine environments is to some extent uncertain.	
S	Does the DRS have the potential for additional direct or indirect impacts on biodiversity across Scotland?	0	None.	
	This example scheme will support the protection of ecosystems by incentivising consumers to recycle materials; to the benefit of marine and terrestrial habitats through reduced littering. The ease of use of the example scheme and consequent increased recycling capture rate and reduced littering is considered to be a benefit for biodiversity. This DRS can therefore be assessed as offering a good level of benefit to the protection and enhancement of terrestrial, marine and coastal ecosystems, habitats and biodiversity beyond that offered by the previous example scheme.			

Materials in scope	All Materials	All Materials			
Type of scheme	Take back to any	Take back to any place of purchase (with cartons and cups)			
Deposit	£0.10				
Capture rate	80%				
Primary (P) Secondary (S)	SEA Criteria	Score	Commentary		
Ρ	1.Will the DRS a. protect and/or enhance designated nature	++/?	This example scheme will support protection of designated nature conservation sites by incentivising a reduction in litter to recoup deposit values.		



	conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?		This example scheme will provide greater benefits through the increased convenience of extensive return points, as well as the increased range of accepted materials. The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. With regards to the effects of litter on biodiversity the marine environment, the relationship is clearly established112. As discussed in example scheme 1, the Scottish Government, European Commission and Marine Conservation Society have identified a DRS as a positive move towards reducing the effects of litter in coastal waters is unknown.	
			Overall, this example scheme is considered to have a positive benefit for biodiversity however the exact extent of that benefit is unclear.	
			Mitigation:	
			None	
			Assumptions:	
			None.	
			Uncertainties:	
			None.	
Ρ	b. support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	++/?	It is anticipated that this example scheme would support terrestrial and marine ecosystems, however for the reasons discussed in the response to part (a), the significance of the effect on marine environments is to some extent uncertain.	
Ρ	c. help avoid pollution of the terrestrial, coastal and marine environments?	++/?	It is anticipated that the example scheme would help avoid pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in the response to part A, the significance of the effect on marine environments is to some extent uncertain.	
S	Does the DRS have the potential for additional	0	None	

¹¹² Kühn S., Bravo Rebolledo E.L., van Franeker J.A. (2015) *Deleterious Effects of Litter on Marine Life*. In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham ¹¹³ Marine Conservation Society (2017) *Deposit Return System*. Available online:

https://www.mcsuk.org/clean-seas/drs



direct or indirect impacts on biodiversity across Scotland?			
This example scheme will support the protection of ecosystems by incentivising consumers to recycle materials; to the benefit of marine and terrestrial habitats through reduced littering. The ease of use of this example scheme – through increased range of return points and wider range of accepted materials- will facilitate an increased recycling capture rate and reduced littering however the extent of this benefit is unknown. This example scheme is considered to be a benefit for biodiversity.			
This example schem and enhancement o that offered by the	ne can therefoi of terrestrial, n previous exam	re be assessed as offering the strongest benefit to the protection narine and coastal ecosystems, habitats and biodiversity beyond aple schemes.	

7.4 Mitigation and enhancement

Each example scheme demonstrates clear opportunities to minimise the impact of litter upon Scotland's biodiversity. The example schemes each offer benefit that will offer improvements to efforts to protect and enhance habitats across Scotland. This section summarises potential mitigation recommendations to be considered broadly across all example schemes.

Table 7.1 Mitigation and enhancement recommendations

Example Scheme	Mitigation recommendations				
Example 1: Take back to dedicated points	Ensure that the location of dedicated take back points is conveniently located to ensure visitors to fragile habitats are able to conveniently return items to nearby take back points.				
Example 2: Take back to dedicated points and some shops (with cartons and cups)	No additional mitigation measures identified to those for example scheme 1.				
Example 3: Take back to any place of purchase	No additional mitigation measures identified to those for example scheme 1.				
Example 4: Take back to any place of purchase (with cartons and cups)	No additional mitigation measures identified to those for example scheme 1.				



8. Cumulative Effects

Schedule 3 (6) (e) of the Environmental Assessment (Scotland) Act 2005 requires that the *"secondary, cumulative and synergistic effects"* of the DRS are assessed. This section provides an assessment of the cumulative effects of each example scheme both alone (Section 8.1) and in-combination with other plans and programmes (Section 8.2).

It should be noted that the cumulative effects of the example schemes are difficult to accurately assess at this stage given the inherent uncertainties concerning (inter alia): the preferred scheme, or components of the example schemes, to be taken forward; the timing of scheme implementation; the location and specific nature of any infrastructure required; and the actual capture rates.

8.1 Cumulative effects of example schemes

This section presents the cumulative effects for each of the four example schemes. The cumulative effects identified are based on an overall judgment of the effects of each scheme on the four SEA topics included in the assessment, taking into the range of effects on the assessment questions/SEA criteria as presented in sections 4 to 7 (i.e. whether significant or minor, positive or negative).

The cumulative effects of the four example schemes against each SEA topic are summarised in **Table 8.1** and discussed in-turn in the sections that follow.

Example scheme	Material Assets	Climatic Factors	Landscape and Visual Impacts	Biodiversity
Example 1: Take back to dedicated points	+/?	+/?	++/?	++/?
Example 2: Take back to dedicated points and some shops (with cartons and cups)	+	+/?	++/?	++/?
Example 3: Take back to any place of purchase	+	++/?	++	++/?
Example 4: Take back to any place of purchase (with cartons and cups)	++/?	++/?	++	++/?

Table 8.1 Summary of cumulative effects from Example Schemes





8.1.1 Example scheme 1: Take back to dedicated points

The "Take back to dedicated points" scheme would be established by regulation but with no requirement on any type of business to participate as a return location.

No significant cumulative positive effects associated with this example scheme have been identified.

The implementation of this scheme would be expected to increase capture rates to 60% for targeted materials (although it could be higher), generating a cumulative positive effect on material assets. An increase in recycling to 78% would, in-turn, be expected to generate cumulative positive effects in respect of climatic factors, associated with the diversion of waste material from landfill and incineration (generating an estimated materials savings of 1,474kt and emissions savings of 2,729ktCO₂eq until 2043) and landscape and visual impacts and biodiversity, related to reduced littering. However, in light of the limited target materials (PET bottles) and the relatively limited number of return points, the magnitude of the positive effects identified is unlikely to be significant and, relative to other example schemes, this example scheme would offer a limited contribution to Scottish waste and environmental strategies. With specific regard to climatic factors, it should be noted there remains some uncertainty with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials) and there would also be emissions associated with travel by consumers to/from collection points.

No cumulative significant negative effects have been identified during the assessment. As with all example schemes, this example scheme could require new infrastructure (such as the counting centre) which could have a minor, localised adverse impact on landscape character and visual amenity during both construction and operation (depending on the location and scale of the facilities, the existing landscape character and the proximity of sensitive receptors).

Example scheme 2: Take back to dedicated points and some shops (with cartons and cups)

This example scheme would be established by regulation and would require retailers to ensure a return location within a set proximity of their premises or accept containers for return directly.

The "Take back to dedicated points and some shops (with cartons and cups)" example scheme would allow consumers to return a wider range of containers to more convenient return points (relative to example scheme 1), increasing the material recovered and quality by segregating target materials from food wastes and other residual waste contaminants. This example scheme is anticipated to capture 70% of target material (although it could be higher), supporting the Scottish Government's waste strategies and targets; in consequence, it has been assessed as having an overall cumulative significant positive effect on material assets.

No further cumulative significant positive effects have been identified. The diversion of materials into the example scheme will support national reductions in GHG emissions; under a 70% capture rate leading to an 86% recycling rate assumed in this example scheme, it is estimated 2,072kt of material will be diverted from landfill and incineration with associated emissions savings of 3,612ktCO₂eq until 2043. This has been assessed as having a cumulative positive effect on climatic factors, although some uncertainty remains with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials) and there would also be emissions associated with travel by consumers to/from return points.

As with the "Take back to dedicated points" example scheme, this example scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. This has been assessed as having a cumulative positive effect on landscape and visual impacts. A reduction in litter may also generate cumulative significant positive effects on biodiversity, particularly in respect of those sites protected for their importance to wild birds and marine habitats which are particularly vulnerable to the effects of litter.





No significant negative effects have been identified during the assessment. As with all example schemes, this example scheme could require new infrastructure (such as the counting centre) which could have a minor, localised adverse impact on landscape character and visual amenity during both construction and operation (depending on the location and scale of the facilities, the existing landscape character and the proximity of sensitive receptors).

8.1.3 Example scheme 3: Take to any place of purchase

The "Take to any place of purchase" example scheme would be established by regulation where individual retailers would be required to act as a return location.

Relative to those example schemes involving a return to dedicated points, the "Take to any place of purchase" example scheme would increase accessibility to collection points significantly, providing a convenient scheme for consumers to redeem their deposit value and thereby encouraging use. In this context, this example scheme is expected to capture 80% of target material (although it could be higher) which offers a strong opportunity to contribute toward Scottish waste and environmental objectives. **Overall, the example scheme has therefore been assessed as having a cumulative significant positive effect on material assets**; however, it should be noted that this scheme would target PET bottles only, limiting its potential to increase overall recycling rates for plastics in Scotland.

The "Take to any place of purchase" example scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas (although the limited range of materials could result in non-target materials remaining as litter). Further, under this example scheme, the return facilities would be located within existing retail premises such that any associated adverse effects on local landscape character or visual amenity are likely to be negligible. It is notable that a counting centre and 4 bulking sites will be required; these should be located in existing infrastructure where possible. **Overall, this example scheme has been assessed as having a cumulative significant positive effect on landscape and visual impacts**.

A reduction in litter associated with **this example scheme may generate cumulative significant positive effects on biodiversity**, particularly in respect of those sites protected for their importance to wild birds and marine habitats which are particularly vulnerable to the effects of litter.

No further cumulative significant positive effects have been identified. This example scheme will contribute to a reduction in GHG emissions; under the 80% capture rate and anticipated increase of recycling rates to 85% assumed in this scheme, it is estimated 1,970kt of material will be diverted from landfill and incineration with associated emissions savings of 3,644ktCO₂eq until 2043. A "Take to any place of purchase" example scheme would be expected to generate some limited emissions savings given the increased accessibility of deposit locations (relative to example schemes 1 and 2) which may reduce the need for consumers to travel; however, the example scheme may also be associated with an increase in collection vehicle movements given the wider network of return sites. Overall, this has been assessed as having a cumulative positive effect on climatic factors, although some uncertainty remains with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials).

No cumulative significant positive or negative effects have been identified during the assessment of the "Take back to any place of purchase" example scheme.

Example 4: Take back to any place of purchase (with cartons and cups)

This example scheme would be established by regulation on a take back to any place of purchase basis, where individual retailers would be required to act as a return location for any type of container.

Like the "Take back to any place of purchase" example scheme above (example scheme 3), this enhanced example scheme would increase accessibility to collection points, providing a convenient opportunity for consumers to redeem their deposit value and thereby encouraging use; such a scheme is anticipated to





capture 80% of target material (although it could be higher). This example scheme would additionally allow consumers to return a wider range of containers to more convenient return points (relative to the "Take to any place of purchase" example scheme), increasing the material recovered and quality by segregating target materials from food wastes and other residual waste contaminants and supporting the Scottish Government's waste strategies and targets. **Overall, this example scheme is expected to deliver the greatest benefit in terms of increased recycling of the four example scheme considered in this report and has been assessed as having a cumulative significant positive effect on material assets.**

As with the "Take to any place of purchase" example scheme (example 3), this scheme provides an opportunity to reduce litter with associated improvements in the aesthetic appearance of areas adversely affected by litter, including beaches and the streets of more densely populated urban areas. Benefits in this regard are likely to be enhanced under this scheme given the wider range of target materials (relative to the standard scheme). Under this scheme, return facilities would be located within existing retail premises such that any associated adverse effects on local landscape character or visual amenity are likely to be negligible. Similar to example scheme 3, it is notable that a counting centre and 4 bulking sites will be required; these should be located in existing infrastructure where possible. **Overall, this example scheme has been assessed as having a cumulative significant positive effect on landscape and visual impacts.**

This example scheme will support the protection of designated nature conservation sites and terrestrial, coastal and marine ecosystems by incentivising a reduction in litter. The reduction in litter will have a beneficial effect on biodiversity for terrestrial sites of importance for nature conservation and in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Further, as highlighted in **Section 7.4**, ingestion is one of the main impacts on marine wildlife, which can result from litter entering the marine environment. Taking into account the range and expected volume of materials collected under this example scheme, the anticipated recycling rate and accessibility of return locations, a cumulative significant positive effect has been identified in respect of biodiversity.

No further cumulative significant positive effects have been identified. The diversion of materials into the example scheme will support national reductions in GHG emissions; under an 80% capture rate and overall recycling rate of 90% is assumed in this example scheme, it is estimated 2,370kt of material will be diverted from landfill and incineration with associated emissions savings of 4,131ktCO₂eq until 2043. This represents the largest GHG emissions saving of the four schemes considered in this report and reflects the range of materials collected and the anticipated recycling rate. Like the "Take to any place of purchase" example scheme, this example scheme would also be expected to generate some limited emissions savings given the increased accessibility of return locations (relative to the "Take back to dedicated points" example schemes 1 and 2), although as for example scheme 3, there may also be an increase in collection vehicle movements given the wider network of return sites and the increased materials collected. Overall, this example scheme has been assessed as having a cumulative positive effect on climatic factors, although there continues to be some uncertainty with regards to where materials reprocessing would take place (and, therefore, the GHG emissions associated with the transportation of materials).

No cumulative significant negative or negative effects have been identified during the assessment of the Take back to any place of purchase (with cartons and cups) scheme.

8.1.5 Other Cumulative Environmental Effects

As noted in **Section 3.1**, any example scheme could generate a range of other associated environmental effects. These potential effects principally relate to the direct construction and operational effects of infrastructure and operational facilities on human health, soil, air, water and cultural heritage, although there may also be indirect effects on, for example, population. **Table 8.2** provides a high-level assessment of the potential effects of the example schemes on these other topics.




Table 8.2 Other cumulative environmental effects

Торіс	Score	Commentary	
Soil		The construction of facilities could have adverse effects on soil, particularly where infrastructure development results in the loss of greenfield, agricultural land. However, as facilities would likely be small in scale and located within existing waste management sites or retail premises that are previously developed, any adverse effects in this regard are likely to be negligible.	
	0	All example schemes will lead to an increase in the collection of target materials and a reduction in materials being addressed through existing waste management options. Indirectly, and to a limited extent, this may then affect the demand for expansion of waste management facilities (such as landfill), although the increased supply of high quality secondary materials could also lead to new or expanded industrial facilities to process the materials.	
		Overall, effects on this topic are expected to be neutral.	
Water		The construction of facilities could have adverse effects on water, particularly where development is in close proximity to waterbodies, areas of flood risk and/or results in increased surface water run-off. However, as facilities would likely be small in scale and located within existing waste management sites or retail premises, any adverse effects in this regard are likely to be negligible.	
	0	All example schemes will lead to an increase in the collection of target materials and a reduction in materials being addressed through existing waste management options. To ensure such material is clean of contaminants before processing, they will be washed, requiring water, with the resulting waste water requiring treatment, prior to reuse. However, in a national context, it is not anticipated that the volume of water required during operation would be significant.	
		The operation of an example scheme may indirectly lead to a reduction in the mobilisation of contaminants associated with the landfill of waste which may improve water quality; however, given the existing legislation and controls in place to ensure the safe management of waste facilities (such as the Pollution Prevention and Control (PPC) Regulations and Controlled Activity Regulations (CAR), any positive effects in this regard are likely be very minor.	
		Introduction of an example scheme is anticipated to reduce litter in waterways as shown from research in the assessments. The potential of the DRS to reduce litter in waterways is also supported by the Marine Conservation Society (MCS).	
		Overall, effects on this topic are expected to be neutral.	
Air	0	The construction and operation of facilities could have localised adverse effects on air quality from the emissions to air from construction of new sites and vehicle movements. This would be dependent on the location of development and transport routes as well as the proximity of sensitive receptors; however, facilities would likely be small in scale and located within existing waste management sites or retail facilities.	
		The operation of an example scheme will (depending on the example scheme considered) lead to some increase in vehicle movements. This may be related to consumers taking the materials to collected points or from an	





Торіс	Score	Commentary
		increase in collection vehicle movements, both of which may be associated with localised air quality effects. However, overall, any changes would likely be small (relative to the current baseline) and in consequence, effects in this regard are likely to be negligible.
		The operation of any example scheme may reduce emissions to air and odour associated with landfill and the incineration of waste; however, given existing legislation and the controls in place to ensure the safe management waste facilities, any positive effects in this regard are likely be very minor. Overall, effects on this topic are expected to be neutral.
Cultural heritage and the historic environment	0	The construction of facilities could have adverse effects on cultural heritage assets. Such effects may be direct (for example, the loss of or damage to an asset) or indirect (due to effects on the settings of assets). However, as facilities would likely be small in scale and located within existing waste management sites or retail premises, any adverse effects in this regard are likely to be negligible.
		The operation of an example scheme would be expected to reduce litter across which could improve the settings of heritage assets and historic landscapes, although such effects are unlikely to be significant, given the current site care plans for such assets.
		overan, the effect of this topic has been assessed as neutral.

The high-level assessment presented in **Table 8.2** above indicates that cumulative effects associated with the four example schemes on, soil, air, water and cultural heritage are unlikely to be significant. This principally reflects the nature and scale of development associated with a DRS and that facilities are likely to be located within, or in close proximity to, existing waste management facilities or retail premises.

8.2 Cumulative effects of a DRS with other plans and programmes

The Scottish DRS sits within the context of a number of other plans and programmes relevant to the management of waste and its effects; these plans and programmes are identified in sections 4 to 7 of this report.

The effects of any example scheme in combination with these other plans and programmes are difficult to meaningfully or accurately assess, particularly given the inherent uncertainties with respect to the preferred example scheme to be taken forward and the location of any associated future development/infrastructure. However, taking into account the findings of the assessment presented in **Section 8.1** above, it is anticipated that any the example scheme would support the aims, objectives and targets of a number of other plans and programmes. By increasing the capture of recyclate, any example scheme would strongly support those plans and programmes related to the sustainable management of waste including in particular Scotland's Zero Waste Plan, which introduced a target for 70% of all waste to be recycled, and only 5% landfilled, by 2025. Indirectly, the example schemes would also be likely to support other related plans and programmes including those in respect of climate change (such as The Climate Change (Scotland) Act 2009) and landscape and biodiversity (for example, A Marine Litter Strategy for Scotland and The Scottish Biodiversity Strategy). This reflects the potential for the example schemes to generate opportunities to reduce litter and generate GHG emissions savings.

At this stage, it is not predicted that any example schemes would create conflict with the objectives of the other plans and programmes identified.





It is also important to recognise that the development of the DRS for Scotland is not operating in isolation, with the UK government also indicating that it is considering opportunities for a DRS. There is potential for cross-border issues to emerge should DRS in Scotland and England not be harmonised. For example, the absence of a DRS in England, or one that involves different deposit/return values, may lead to consumers purchasing products across borders at a cheaper price. Such effects are noted in a review of the Danish DRS in relation to the German DRS where there is a substantial price differential between comparable (alcoholic) drinks¹¹⁴. It is understood that both governments are discussing the potential for collaboration on the deposit example scheme to avoid these problems.



¹¹⁴ Arcadis (2015) Marine Litter study to support the establishment of an initial quantitative headline reduction target - SFRA0025. A final report for the European Commission DG Environment Project number BE0113.000668. Available online at: http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/final_report.pdf

9. Conclusions

This section outlines the headline findings of the strategic environmental assessment. It summarises the anticipated environmental effects of each example scheme before recommending proposal for monitoring the impact of any chosen example scheme.

The next step will involve public consultation. The section concludes by providing information to the public on how to share their thoughts and concerns on the proposed example scheme.

9.1 What are the environmental effects of the Draft DRS?

The potential reduction in demand for virgin material and diversion of litter resulting from any example scheme provides Scotland with an opportunity to improve its national environmental footprint through achieving a sustained behavioural change across society.

The example schemes presented in this report are anticipated to capture target materials which are currently sent to landfill or incineration. The chosen example scheme will be introduced with the intention to:

- Increase the quantity of target materials captured for recycling;
- Improve the quality of materials captured, to allow for higher value recycling;
- Encourage wider behaviour change around materials;
- Deliver maximum economic and societal benefits for Scotland.

The DRS has the potential – subject to the exact design and successful uptake by consumers – to provide environmental benefits across:

- Material assets (and in particular the increased recycling of plastics, glass, aluminium and steel);
- Climatic factors and carbon and total GHG emissions;
- Landscape; and
- Biodiversity.

Available data demonstrates the potential material tonnages and carbon tonnages that can be saved through implementation of each example schemes. These are presented in Section 9.2.

9.2 **Comparison of the Draft Example Schemes**

The example schemes are anticipated to capture target materials which are currently sent to landfill or incineration. This will increase recyclate tonnages across Scotland and will provide carbon savings through diversion of wastes from landfill or incineration. The anticipated savings over the 25 years period of each example scheme are shown in Table 9.1 below:



Table 9.1 Anticipated savings over a 25 year period (2018 – 2043).

	Example 1: Take back to dedicated points	Example 2: Take back to dedicated points and some shops (with cartons and cups)	Example 3: Take back to any place of purchase	Example 4: Take back to any place of purchase (with cartons and cups)
Tonnages of target materials diverted from landfill or incineration to 2043 (kt)	1474	2,072	1,970	2,370
Carbon savings to 2043 ktCO2eq ¹¹⁵	2,729	3,612	3,644	4,131

9.3 **Proposals for monitoring**

Section 19 of the Environmental Assessment (Scotland) Act 2005 requires the Responsible Authority to monitor significant environmental effects of the implementation of the Plan. The Responsible Authority will be the Scottish Government.

The importance of implementing effective monitoring proposals is confirmed within the DRS SEA Screening and Scoping Report which highlights the importance of linking monitoring proposals with mitigation measures where appropriate. It will be important therefore for the Scottish Government to develop a monitoring protocol for consideration following selection of a preferred example scheme. Any monitoring protocol should consider the following:

- A proposed roadmap of actions to implement and manage the chosen example scheme.
- Clear indicators for progress including, for example, the number of collection points introduced and operational, collected tonnages of materials, contamination rates, carbon emissions, GHG emissions and litter monitoring (however we note the general weakness in litter monitoring data and assessments). The Key Scottish Environment Statistics 2016 Report provides information on a wide range of environmental topics and indicators, including indicators for GHG emissions and climate, air quality, land use, water, waste and biodiversity. It also includes key datasets on the state of the environment in Scotland. These could also help in identifying opportunities to adapt Scottish policy and actions in relation to climate change to meet changing needs and circumstances.
- Recommendations on the setting of annual targets and annual monitoring and reporting of Scotland's overall GHG emission abatement is undertaken by the Committee on Climate Change. This process involves reporting emissions trends and performance against these targets at both the sectoral and national levels.
- The Water Framework Directive requirements for monitoring of water quality by member states, and monitoring of Scotland's rivers, canals, freshwater lochs, estuaries and coastal and



¹¹⁵ Carbon savings include total carbon change including reductions from carbon associated with waste management of the containers as well as the carbon savings associated with the increased recycling.

offshore waters is undertaken by SEPA and reported annually. Monitoring as part of the Water Framework Directive includes a biodiversity element, through the requirement to consider the ecological quality of water in this monitoring programme. The responsible authority, being the Scottish Government, should continue to work with this body and to regularly report the ongoing impact of the implemented example scheme.

- Changes to national levels of biodiversity are also monitored, with a focus on the status of valued and designated biodiversity features, for example, Special Areas of Conservation and Special Protected Areas. Additionally, the monitoring and reporting of air quality currently takes place at set sites located in urban areas throughout Scotland, and key performance indicators from the development of the Cleaner Air for Scotland: The Road to a Healthier Future are also monitored. Many of these programmes will also help to identify effects arising from the broad range of policies and proposals that have been covered in this assessment.
- It is recommended that the monitoring framework take note of the request from SEPA, that the monitoring framework" examines the potential for unintended consequences to result from a DRS e.g. potential for manufacturers/retailers to switch products which fall outside of the example scheme and which in themselves could lead to negative environmental effects including increases in greenhouse gas emissions from production or an increase in the manufacture of products which cannot be recycled".

Existing monitoring is likely to be complemented by monitoring for specific policies and proposals at the sectoral level. For example:

- The Energy in Scotland series reports on changes to Scotland's energy mix, and provides information on how energy is both generated and consumed.
- Growth in new woodland and forestry are routinely monitored, and performance is reported against annual planting targets.
- Scotland's performance against the waste hierarchy is reported annually, and improvements in reducing landfill waste and increasing utilisation of waste are regularly monitored and reported.

It is also likely that as new policies and proposals are brought forward, further monitoring proposals may be developed to review progress of their implementation.

9.3.1 Optimising the environmental benefits from a DRS

As discussed in the DRS SEA Screening and Scoping Report, this SEA should identify a specific example scheme or detailed design of an alternative DRS as an outcome of the SEA. However no definitive example scheme or design features have been proposed at this stage. Instead <u>the four example Schemes provided</u> in the public consultation and OBC provide a basis for assessing the environmental benefits of various components of scheme design.

Following assessment of the example schemes, it is recommended that any chosen DRS exhibits the following characteristics:

- **Materials**: That the DRS accepts the widest possible range of materials in order to have the biggest impact towards meeting the Scottish Governments recycling targets whilst embedding a culture and paradigm of recycling;
- **Return Points**: That the DRS offer return to point of purchase points to maximise convenience to service users, maximise capture rates of materials and minimise the impacts of unnecessary travel;
- **Scheme Performance**: That the service be a truly national service allowing ease of participation in both urban and rural settings;

. . .



- **Consumer Information/ Contamination Prevention**: That a Scottish labelling scheme be implemented to prevent contamination by containers which have not originated in Scotland and have a deposit paid upon them as this may jeopardise expected recycling rates and carbon savings;
- **Infrastructure and Logistics**: That existing infrastructure is used to house bulking sites and counting centres to minimise the environmental impact of implementing a DRS.

9.4 Next steps

Public views are now sought on the example schemes and this Environmental Report.

We welcome your views on any aspect of this Environmental Report. We are particularly interested to receive your response to the following questions:

- 1. To what extent does the Environmental Report set out an accurate description of the current baseline and the business as usual scenario? (Please give details of additional relevant sources)
- 2. Do you think that the Environmental Report has correctly identified the likely significant effects of the example schemes? (If not, what other significant effects do you think we have missed, and why?)
- 3. Do you agree with the recommendations and proposals for mitigation and enhancement of the environmental effects set out in the Environmental Report? (If not, what do you think should be the key recommendations and why?)
- 4. Are you aware of any further information that will help to inform the findings of the assessment? (Please give details of additional relevant sources)
- 5. Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the example schemes? (If not, what measures do you propose?)

The consultation runs until Autumn 2018. Comments on the Draft Strategy and the Environmental Report can be submitted online on the Scottish Government website¹¹⁶. General queries about the Scottish DRS process can be submitted to Zero Waste Scotland.

Following the conclusion of the consultation period, the responses received on both the example schemes and this Environmental Report will be analysed and reported. Key messages from respondents, including those of the various stakeholder groups, will be highlighted and the findings of the analysis will be taken into account in the selection and adoption of the final DRS.

Upon adoption of the DRS, a Post-adoption SEA Statement will be prepared. This Statement will reflect on the findings of the SEA assessment and the views expressed in the consultation, and outline how the issues raised have been considered in the finalisation of the DRS for Scotland.

¹¹⁶ Strategic Environmental Assessment Gateway. Available online at:

http://www.gov.scot/seag/publicsearch.aspx? ga=2.108556683.801215196.1528901962-2095685640.1488878586



BAU	Business as Usual
BRIA	Business Regulatory Impact Assessment
DRS	Deposit Return Schemes
ER	Environmental Report
FBC	Full Business Case
HDPE	High Density Polyethylene
MCS	Marine Conservation Society
NTS	Non-Technical Summary
OBC	Outline Business Case
PAS	Post Adoption Statement
PET	Polyethylene terephthalate
RVM	Reverse vending machine
SAC	Special Areas of Conservation
SEA	Strategic environmental assessment
SEPA	Scottish Environmental Protection Agency
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Importance
ZWS	Zero Waste Scotland



Appendix A Scoping Consultation Responses

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
Scottish	Environment Protection Agency (SEPA)		
SEPA2	SEPA suggests that consideration of relative merits should include examination of the potential for a model to perform differently depending on the geographic area to which it relates e.g. urban versus rural areas.	Comment noted. The proposed DRS is a national scheme; however, it is noted that performance in urban and rural locations may be different. Where relevant this will be noted in the commentary on the effects of the different example schemes.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment
SEPA3	SEPA recommends that the assessment also examines the potential for unintended consequences to the result from a DRS e.g. potential for manufacturers/retailers to switch products which fall outside of the DRS and which in themselves could lead to negative environmental effects including increases in greenhouse gas emissions from production or an increase in the manufacture of products which cannot be recycled. This aspect should also be considered an important aspect of the DRS monitoring framework.	Agreed. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify where any unintended effects occur. Where relevant this will be noted in the commentary on the effects of the different example schemes.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment
SEPA4	SEPA recommends that consideration of the issue of litter should be expanded to include examination of the potential benefits a reduction in littering may have for soil, water and biodiversity (e.g. reduction in micro-plastics which may become part of the food chain).	Comment noted. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify any additional effects on topics such as soil, water or biodiversity. Where relevant this will be noted in the commentary on the effects of the different example schemes. In consequence, it is not proposed to expand the topics considered in the SEA.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
			assessment
SEPA5	SEPA suggests that the topic of air should be included in the scope for the SEA if not already included in the consideration of climatic factors or material assets.	Comment noted. Air quality is not included within the climate factors or material asset topics. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify any additional effects on air quality. Where relevant this will be noted in the commentary on the effects of the different example schemes. In consequence, it is not proposed to expand the topics considered in the SEA.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment
SEPA7	SEPA notes that when deciding how to record and present the secondary/indirect effects, it might be helpful to consider how these might be used in the future e.g. for detailed project-level planning.	Agreed. A table summarising the indirect effects has been included in the assessment of cumulative effects (Table 8.2). Proposed mitigation (e.g. environmental regulation or planning requirements) have been included in the Environmental Report.	Table 8.2
SEPA10	SEPA has produced SEA topic guidance for issues which fall within their remit, which they suggest might be useful to refer to as the assessment progresses.	Comment noted. The SEA topic guidance for climatic factors and material assets will be used, where relevant, to inform the assessment of effects against these topics which have been scoped into the assessment.	Chapter 4. Material Assets
Scottish	Natural Heritage		
SNH2	SNH advise that biodiversity, flora and fauna are scoped into the assessment for both tier 1 and tier 2 considerations.	Comment noted. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify any additional effects on topics such as flora and fauna. Where relevant this will be noted in the commentary on the effects of the different example schemes. Given the generic (i.e. non-site-specific) nature of the example schemes, it is noted that consideration of site specific aspects of flora and fauna would be premature and it is likely that the commentary on effects would be of an equivalent generic nature. Such constraints will be noted in the assessment, with recommendations for further consideration when more site-specific aspects of the DRS are taken forward.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
		Biodiversity will now be included as a tier 1 topic. Contextual information will be collated from SNH and Scottish Government focusing on onshore and offshore designations and the condition of designated features. As already noted, the level of assessment of the effects on biodiversity will be at a high level, proportionate to the information in the example scheme descriptions. Whilst site specific effects could be possible (and will be described in broad terms associated with direct effects from siting of any necessary infrastructure), the nature of other indirect effects can only be described generically.	Chapter 7: Biodiversity
SNH3	SNH welcomes the consideration given to indirect and secondary effects through the use of a two-tier approach, but notes that it is likely that all SEA topics will have secondary effects to some degree which could be shown clearly in a table.	Agreed. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify any additional effects on all SEA topics. Where relevant this will be noted in the commentary on the effects of the different example schemes. If it is considered to be more effective, this information will also be presented in a table.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment
SNH5	SNH recommends that the context to a DRS is set out before the assessment in the Environmental Report.	Agreed. The context of the DRS will be presented before the assessment in the Environmental Report.	2.2: A Scottish Deposit Return Scheme
SNH6	 SNH suggests expanding upon the list of PPS set out in Section 1.1. to include plans that are likely to affect, or be affected by the DRS policy, such as: Scottish Biodiversity; The Habitats Regulations; The European Landscape Convention; SNH Landscape Policy Framework; The Climate Change Plan (2018); and The Scottish Soil Framework 2009. 	Agreed. The additional plans and programmes proposed will be included, where relevant, in the review of plans and programmes considered as part of the contextual information identified in the Environmental Report.	 4.1. Material Relationship with other Plans, Programmes and Strategies and Environmental Objectives 5.1 Climatic Factors Relationship with other Plans, Programmes and Strategies and Environmental



Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
	SNH notes that it would be useful to briefly comment on why each plan is relevant to DRS, as well as if they have been previously been subject to SEA, noting how the assessment can inform the DRS SEA.		Objectives 6.13. Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives 7.1. Relationship with other Plans, Programmes and Strategies and Environmental Objectives
SNH7	SNH suggests providing the overview of the environmental protection objectives, the environmental baseline and the methodology for collating information earlier in the Environmental Report to allow it to inform the assessment.	Agreed. The environmental context (the relevant plans and programmes and baseline information) will be presented before the assessment of the example schemes in the Environmental Report. This information will be presented for the three topics scoped into the assessment (climate change, material assets and landscape). The approach to the assessment will be presented before the contextual information and assessment is provided.	4.1. Material Relationship with other Plans, Programmes and Strategies and Environmental Objectives 5.1 Climatic Factors Relationship with other Plans, Programmes and Strategies and Environmental Objectives 6.1. Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives 7.1. Relationship with other Plans, Programmes and Strategies and Environmental Objectives

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
SNH8	SNH notes that all SEA topics should be included to ensure that all aspects of the environment are considered at this early stage to help provide transparent rationale for why certain topics can be scoped out.	Comment noted. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify where any additional effects on all SEA topics.	 4.3 Climatic Factors assessment 5.3. Material impacts assessment 6.3. Landscape and Visual Impacts: impacts assessment
		Biodiversity will now be included as a Tier 1 topic per SNH2. Contextual information will be collated from SNH and Scottish Government focusing on onshore and offshore designations and the condition of designated features. As already noted, the level of assessment of the effects on biodiversity will be at a high level, proportionate to the information in the example scheme descriptions. Whilst site specific effects could be possible (and will be described in broad terms associated with direct effects from siting of any necessary infrastructure), the nature of other indirect effects can only be described generically.	Chapter 7. Biodiversity
SNH9	SNH suggests ensuring that the key environmental characteristics and issues are set out for each SEA topic, as well as information on any relevant environmental problems in the plan area.	Agreed. The environmental characteristics as well as any environmental problems will be presented for the three topics scoped into the assessment (climate change, material assets and landscape).	 4.3 Climatic Factors assessment 5.3. Material impacts assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity impacts assessment
SNH10	SNH notes that the environmental baseline is currently limited in the aspects which have been considered, e.g. in	Agreed. Environmental baseline information will be presented for the three topics scoped into the	4.3 Climatic Factors assessment



Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
SNH17	SNH suggests that cumulative effects should be assessed for aspects of the plan which, in isolation, are not found to have significant effects. It would be useful to detail these under each of the SEA topics.	Comment noted. The cumulative effects of the preferred example scheme will be identified (for the plan as a whole, and in combination with other plans).	Section 8. Cumulative Effects
		Comment noted. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify any additional effects on soil and water. Where relevant this will be noted in the commentary on the effects of the different example schemes. In consequence, it is not proposed to expand the topics considered in the SEA.	 4.3. Material impacts assessment 5.3 Climatic Factors assessment 6.3. Landscape and Visual Impacts: impacts assessment 7.3. Biodiversity
SNH18	SNH notes that it is likely that all SEA topics will have a degree of secondary or indirect effects as a result of a DRS and perhaps a second table is required to show this wider consideration. From their remit, SNH advise that soil and water should be scoped into this assessment in respect of indirect or secondary effects.	Biodiversity will now be included as a Tier 1 topic per SNH2. Contextual information will be collated from SNH and Scottish Government focusing on onshore and offshore designations and the condition of designated features. As already noted, the level of assessment of the effects on biodiversity will be at a high level, proportionate to the information in the example scheme descriptions. Whilst site specific effects could be possible (and will be described in broad terms associated with direct effects from siting of any necessary infrastructure), the nature of other indirect effects can only be described generically.	impacts assessment Chapter 7. Biodiversity
SNH20	SNH recommends amending the assessment questions to focus on only significant effects.	Comment noted. The questions contain those aspects of the topic that are considered relevant to the determination of significance. In consequence, it is not proposed to amend the questions.	Not applicable
SNH21	SNH notes that it is important to consider all SEA topics for significant effects rather than only those scoped in for the DRS as there may be different implications for each alternative.	Comment noted. The Tier 2 assessment question 'Does the DRS have the potential for additional direct or indirect environmental effects in other topic areas?' will be used to identify where any additional effects	4.3. Material impacts assessment 5.3 Climatic Factors assessment

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
		on all SEA topics occur from the example schemes considered.	6.3. Landscape and Visual Impacts: impacts assessment
			7.3. Biodiversity impacts assessment
		Biodiversity will now be included as a Tier 1 topic per SNH2. Contextual information will be collated from SNH and Scottish Government focusing on onshore and offshore designations and the condition of designated features. As already noted, the level of assessment of the effects on biodiversity will be at a high level, proportionate to the information in the example scheme descriptions. Whilst site specific effects could be possible (and will be described in broad terms associated with direct effects from siting of any necessary infrastructure), the nature of other indirect effects can only be described generically.	Chapter 7. Biodiversity
SNH22	SNH is content with the mitigation and monitoring methodology proposed.	Comment noted.	Not applicable
SNH23	SNH notes that it would be helpful if the SEA statement could give direction for subsequent assessment requirements.	Agreed. A table summarising the indirect effects has been included in the assessment of cumulative effects (Table 8.2). Proposed mitigation (e.g. environmental regulation or planning requirements) have been included in the Environmental Report that relate to individual scheme level requirements (in addition to the more site specific effects that will need to be identified) at the next tier of assessment.	Table 8.2.

Appendix B SEA Compliance Checklist

Environmental Report Requirements	
Relevant Sections of the Environmental Assessment Act	Section(s) of This Report
14 (2) The report shall identify, describe and evaluate the likely significant effects on the environment of implementing—	
(a) the proposals in the plan or programme; and	See sections:
	4.3 Material assets: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
	5.3 Climatic Factors: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
	6.3 Landscape and Visual Impacts: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
	7.3 Biodiversity: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
(b) reasonable alternatives to the plan or programme.	See sections:
	4. Material assets
	5. Climatic Factors
	6. Landscape and Visual Impacts
	7. Biodiversity
14 (3) The report shall include such of the information specified in schedule 3 as may reasonably be required.	
Information referred to in schedule 3	
1. An outline of the contents and main objectives of the	See sections:
other qualifying plans and programmes.	1.1Deposit Return Scheme
	1.2 Strategic Environmental Assessment
	1.3 Purpose of this Environmental Report
	1.4 Environmental Report Structure
	2. Deposit Return Schemes

	2.1 Overview of Deposit Return Schemes
	2.2 A Scottish Deposit Return Scheme.
	2.3 Example Schemes and Reasonable Alternatives
2. The relevant aspects of the current state of the	See section:
and the likely evolution thereof without implementation of the plan or programme.	4.2 Material assets; Baseline Characteristics
	5.2 Climatic Factors; Baseline Characteristics
	6.2 Landscape and visual effects; Baseline Characteristics
	7.2 Biodiversity; Baseline Characteristics
3. The environmental characteristics of areas likely to be significantly affected.	See section:
	4.2 Material assets; Baseline Characteristics
	5.2 Climatic Factors; Baseline Characteristics
	6.2 Landscape and visual effects; Baseline Characteristics
	7.2 Biodiversity; Baseline Characteristics
4. Any existing environmental problems which are relevant	See section:
to the plan or programme including, in particular, those	4.1 Material assets: Polationship with
relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC).	other Plans, Programmes and Strategies and Environmental Objectives
	4.2 Material assets; Baseline Characteristics
	5.1 Climatic Factors: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	5.2 Climatic Factors; Baseline Characteristics
	6.1 Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	6.2 Landscape and visual effects; Baseline

	Characteristics
	7.1 Biodiversity: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	7.2 Biodiversity; Baseline Characteristics
 5. The environmental protection objectives, established at international, Community or Member State level, which are relevant; and the way those objectives and any environmental considerations have been taken into account during its preparation. 	See section:
	4.1 Material assets: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	5.1 Climatic Factors: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	6.1 Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
	7.1 Biodiversity: Relationship with other Plans, Programmes and Strategies and Environmental Objectives
6. The likely significant effects on the environment, including—	See sections:
a) on issues such as -	4. Material assets
	5. Climatic Factors
ii. population;	6. Landscape and Visual Impacts
iv. fauna;	7. Biodiversity
v. flora; vi. soil;	
vii. water; viii. air;	
ix. climatic factors;	
x. indefinit assets, xi. cultural heritage and historic environment, including	
architectural and archaeological heritage; xii. landscape;	
xiii. the inter-relationship between the issues referred to in heads (i) to (xii).	
b) short, medium and long-term effects.	
c) permanent and temporary effects.	
d) positive and negative effects.	
e) secondary, cumulative and synergistic effects.	
7. The measures envisaged to prevent, reduce and as fully	See sections:
environment of implementing the marine spatial plan or	4.3 Material assets: The likely significant

programme.	environmental effects of the Draft DRS and the reasonable alternatives
	5.3 Climatic Factors: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
	6.3 Landscape and Visual Impacts: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
	7.3 Biodiversity: The likely significant environmental effects of the Draft DRS and the reasonable alternatives
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of expertise) encountered in compiling the required information.	See Section 3: The approach to the assessment
9. A description of the measures envisaged concerning monitoring in accordance with section 19.	See section 9.3: Proposals for monitoring
10. A non-technical summary	See pg. 3