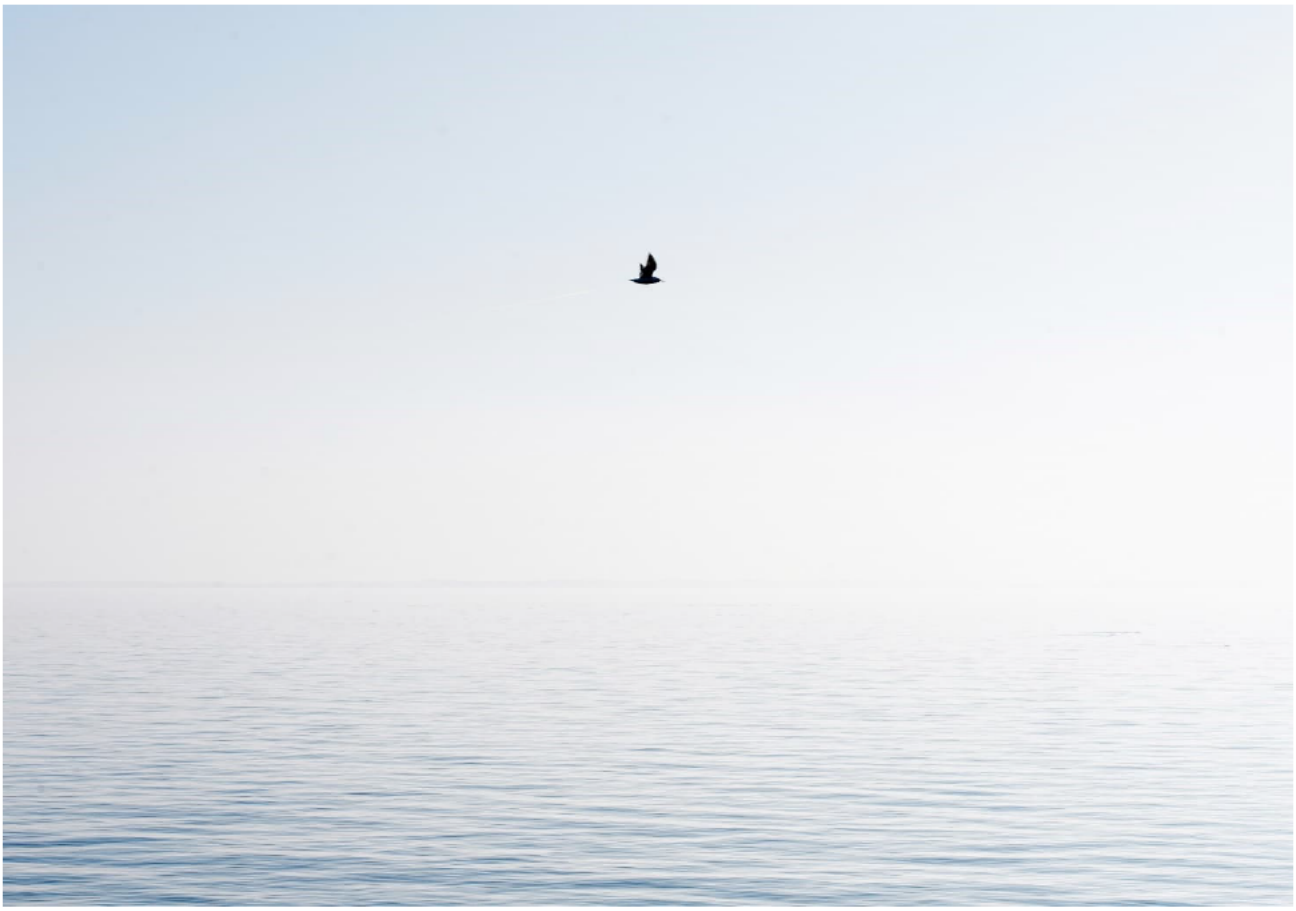
Review of The Ocean Cleanup Final S03 EIA

Final Review Report



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1 Introduction

1.1 Context

The Ocean Cleanup (TOC) has developed an updated Ocean Retention System 03 (S03), designed to collect floating plastic from the Great Pacific Garbage Patch located within the North Pacific Subtropical Gyre (NPSG). Following enhancements to previous system iterations, the S03 aims to improve the overall capacity of the collection system. The system operates on the principle of towing two wings equipped with funnels for plastic collection, managed by two vessels traveling at low cruising speeds. Upon completion of the collection process, the nets are retrieved and brought aboard the ships for transportation to shore (CSA, 2023).

The Dutch Government, the State of the Netherlands, holds a duty of care towards the marine environment, in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). Additionally, the State is bound by various international agreements, which necessitate a commitment to environmental stewardship regarding activities conducted by TOC. Due to the unique nature of TOC's System 03, there exists no pre-established legislation or legal framework applicable to its operations. Consequently, a Covenant outlining the arrangements between the two parties was established in 2018, which has been extended in 2023 and amended in 2024.

In this context, the Dutch Ministry of Infrastructure and Water Management has commissioned Sweco Nederland B.V. to conduct a review of the Environmental Impact Assessment (EIA) of System 03. This EIA was prepared by CSA Ocean Sciences Inc. (CSA) for TOC. The objective of this review is to evaluate whether the EIA for System 03 (CSA, 2023) satisfies the requirements set forth in the Covenant, and whether the broader implications for the marine environment have been adequately addressed, as detailed in Section 1.2 of this report.

This report and its findings are based on a review of the EIA, prepared by Sweco, a response and a discussion with the TOC. The insights and agreements derived from dialogue between Sweco and TOC through e-mail and digital meetings are processed in this report.

In the first phase, the most important thematic topics were identified and assessed based on relevant criteria established by experts in the individual fields. Each criterion was evaluated against its respective topic and the outcomes of this review process are documented here. This final report highlights the key shortcomings identified by Sweco in CSA's/TOC's documentation, provides recommendations for addressing these issues to strengthen the EIA for the S03 system, as well as future EIAs, and responds to the inquiries posed by the Ministry of Infrastructure and Water Management in their assignment specifications.

1.2 Scope

Central to the assessment of the TOC's EIA is the question: "*Does the Ocean Cleanup take the necessary precautions that can reasonably be expected of it to prevent damage to the marine environment, to species present in the area and to the food web as a result of the deployment of the System?*"

The Dutch Ministry of Infrastructure and Water Management tasked Sweco Nederland with reviewing the EIA written by CSA on the following underlying questions:

1. Does the EIA contain the right questions and answers to assess the broad impact of S03 on the marine ecosystem?
2. Does The Ocean Cleanup ask the right questions to assess the impact of their activities?
3. Are the information and the conclusions included in the EIA founded on scientific research?
4. Are the assessments of The Ocean Cleanup based on the most recent scientific insights? And how do other scientist respond to those assessments?
5. Does The Ocean Cleanup adapt an ecosystem-approach?
6. Are the effects on the right species and the food web assessed?
7. Are the conclusions and recommendations from the review of Bureau Waardenburg on the previous system incorporated?
8. Has The Ocean Cleanup performed a sufficient and broad cost-benefit analysis on the environmental impacts of the cleanup-activities?

1.3 Process and methods

The review was carried out in the following three stages:

First stage

The first stage concerns the initial review by Sweco. With regard to the request specification, the information concerning the questions that had to be answered were translated into the following thematical topics:

- EIA requirements.
- Scientific integrity.
- Ecosystem approach.
- Information comprehensiveness.
- Activities and primary effects.
- Preliminary screening of activities and affected resources.
- Mitigation measures and duty of care.
- Recommendations from Waardenburg Ecology.
- Cost-benefit analysis.
- Response to criticisms.

For each topic criteria have been defined. Each topic was subsequently reviewed by an expert on that specific topic. For each of the criteria, an expert judgement rating was given with comments and conclusions in a table:

- s = sufficient.
- p = point of attention.
- i = insufficient.

In addition to the criteria related to the questions, some extra suggestions to the EIA were included. The detailed results of this review based on these criteria can be found in the attached appendices.

In this way, a structured and transparent evaluation has been ensured, where all aspects of the EIA have been reviewed in a traceable and detailed manner. Further details for each review are included in the review tables in the appendix and the specific chapters per topic in the report.

Second stage

This stage concerns the reply on the first review by TOC and subsequent advice by Sweco on the topics that were assessed as (partly) insufficient in the initial review. These remaining topics are:

- Scientific integrity.
- Ecosystem approach.
- Information comprehensiveness.
- Activities and primary effects.
- Cost-benefit analysis.

The reply of the TOC was discussed between TOC and Sweco in an online meeting on September 13, 2024. Further details for each review are included in the review tables with subsequent replies in the appendix and the specific chapters per topic in the report.

Final stage and report

During this last stage the conclusions on all the reviewed topics were reported. These are described in the chapters of this report. It contains the agreed processing of the comments as a result of communications with TOC resulting from an online meeting between TPC and Sweco on October 17, 2024.

1.4 Reading guide

The chapters 2 -10 contain an introduction of each topic, the initial key-comments by Sweco and the agreed processing by TOC. In chapter 11 a summary can be found regarding the answers to the sub-questions and finally the main question. The report also contains a summary of the conclusions on the key topics of the review and the answer to the main question.

2 EIA requirements

2.1 Introduction

This section outlines whether or not the S03 EIA includes all necessary components and information that is required within an environmental impact analysis. The purpose of this topic was to identify if all essential questions have been addressed concerning the effects of the proposed activities. This part of the review is different from assessments of the other factors, as the criteria are formulated by the standard components of an EIA. The assessment describes whether these components are included to a sufficient extent. There are two types of requirements regarding the methodological approach of an EIA. There are requirements concerning the information it must contain (A) and requirements for the assessment of the effects (B), namely that the direct and indirect significant effects of a project are appropriately identified, described and assessed on a case-by-case basis.

The criteria that have been developed to review the EIA on this topic are as follows:

Requirements for the information that an EIA must contain (A)

1. A description of the project with information on the location, design, size and other relevant characteristics of the project.
2. A description of the likely significant environmental effects of the project.
3. A description of the characteristics of the project and/or the measures planned to avoid, prevent or reduce the likely significant adverse environmental effects and, where possible, compensate for them.
4. Description of the reasonable alternatives examined by the client that are relevant to the project and its specific characteristics, indicating the main reasons for the chosen option, in light of the environmental impacts of the project.
5. A non-technical summary of the information referred to in points (1) to (4).
6. Any additional information referred to in Annex IV Directive 2014/52/EU which is relevant to the specific characteristics of a particular project or type of project and to the environmental aspects likely to be affected by it.

Requirements for the assessment (B)

1. The population and human health.
2. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.
3. Land, soil, water, air and climate.
4. Material goods, cultural heritage and the landscape.
5. The relationship between the factors mentioned under 1. to 4.

2.2 Review results

The requirements for the information that an EIA must contain (criteria A 1-6), were largely met. The review on this topic does not concern insufficient valuation on the subsequent criteria. However, some points of attention are addressed which are described as follows. Detailed information on the result of the review on this aspect can be found in Appendix A.

The summary is quite technical in nature and thereby does not meet criterion 5 for a non-technical summary. Despite the complex nature of the project a layman's summary should be included. The requirements for the assessment (criteria B 1-5) are not all met. There is no information on the effects of plastic, or plastic removal on the human population and human health included. These are normally included within an EIA and could also be included in the EIA of the S03.

2.3 Processing review results by TOC

The review comments concern points of attention and no insufficient valuation points. Therefore, these comments were not discussed further. However, these comments remain as a recommendation for further processing to make the EIA complete.

3 Scientific integrity

3.1 Introduction

This section outlines how the S03 EIA manages referencing, citations and how claims made, are supported by scientific sources. The scientific integrity of the EIA has been evaluated by assessing if methods, assumptions, interpretations of results and conclusions were sufficiently supported scientifically and was based on the current knowledge in the field. The scientific evaluation has been done with a focus on chapter 4, 5 and 6.

The scientific integrity of the EIA has been reviewed by the following criteria:

1. Sufficient amount of scientific literature cited: sources of data, previous studies and other supporting information is cited. Statements, interpretations and conclusions are supported by literature.
2. (Most)recent literature cited: recent literature is cited when available.
3. Sufficient quality of literature cited: literature from peer-reviewed scientific journals or recognized authorities or institutes.
4. Correct interpretation of important literature: data or conclusions from literature were relevant, correctly interpreted and not taken out of context.
5. Comprehensive: no important studies or data were missed.

3.2 Review results

The review of this topic resulted in an insufficient valuation on some of the criteria, as well as some points of attention. The comments regarding insufficient valuation are described as follows. The evaluation of all the criteria and a more detailed description can be found in Appendix B.

Throughout the EIA multiple examples of missing references and citations were found. Papers are dated or statements are unclaimed and it remains difficult to check whether this would affect the conclusions. Notably, the number of citations varies between the different sections of the report. Some parts are sufficient, however, several parts, such as long term effects, effects on turtles and fish and fishery resources are lacking on this topic. In addition, the description of the biological environment lacks literature in many places and within the chapter on the Potential Environmental Impacts, the amount of scientific backing varies. Here missing citations missed recent papers and other gaps in the scientific backing were found. More detailed review and comments per paragraph can be found in Appendix B.

3.3 Processing review results by TOC

During the meeting on September 13, 2024, TOC questioned substantiating claims that are common knowledge but lack published scientific data. Sweco advised that TOC refer to expert judgment in the field, which, while less valuable than data-driven sources, demonstrates an effort to address the data gap.

TOC has collected much recent data on the ecology and biodiversity of the Northern Pacific Ocean. To ensure integrity and trust in their documentation, it is acceptable for TOC to reference their internal expertise or published data in EIAs, provided the information is peer-reviewed or traceable.

During the meeting on October 17, 2024, the second review was discussed. TOC acknowledged the comments made in the initial review and agreed to follow the advice to strengthen their scientific integrity and traceability by improving their source management, citations and referencing in the revised EIA.

Key takeaways include the need for TOC to rationalize every claim in their EIA by citing peer-reviewed articles, official reports, or traceable unpublished data. In the absence of sufficient data, consulting field experts and referencing personal communications can support their claims. Additionally, TOC should ensure that the internal review process for report writing meets high standards of integrity, including preventing authors from reviewing their own work. In addition to the agreed processing of the comments valued as insufficient, the comments valued as point of attention remain as a recommendation for further processing to make the EIA complete.

4 Ecosystem approach

4.1 Introduction

This section concerns the extent to which an ecosystem-based approach has been integrated, as is required as a standard for an EIA. This means that the EIA should provide a description of the ecosystem and the interactions between various abiotic and biotic components, including the food web, with particular emphasis on the interactions among different ecosystem components.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Description of the ecosystem and biotic and abiotic relations.
2. Effect analysis on ecosystem level.

4.2 Review results

The review on this topic does concern insufficient valuation on some of the subsequent criteria besides some points of attention. The comments regarding insufficient valuation are described underneath. Detailed information on the result of the review on this topic can be found in Appendix C.

The EIA does not include a specific ecosystem description and is deemed insufficient on most of the accounts required for an ecosystem-based approach. The interactions between species on the level of the ecosystem and how these species interact with the abiotic factors within their environment are not described in the EIA. This would include an analysis of changes in the food web and the inclusion of indirect effects.

The EIA lacks a specific description of the ecosystem and is considered not adequate in terms of fulfilling the requirements for an ecosystem-based approach. It does not provide detailed information about the environment impacted by the cleanup system at the ecosystem level. A more comprehensive approach is necessary to achieve an ecosystem-based assessment.

While the effects on various species are discussed to some extent, an ecosystem-based approach necessitates a broader evaluation. Therefore, this would also include an analysis of the changes within the food web and the consideration of indirect effects. Given that S03 serves as a test for applying the method on a larger scale, quantifying the effects at the ecosystem level should be a crucial component of the EIA. More detailed review and comments per paragraph can be found in Appendix C.

4.3 Processing review results by TOC

Due to the limited research on the marine ecosystem in the North Pacific, Sweco recognizes the challenges of developing an EIA using a suitable ecosystem-based approach, given the inherent complexity. TOC has requested Sweco's guidance on effectively implementing this approach in light of existing knowledge gaps.

Sweco recommends incorporating a schematic representation of the ecosystem and the food web. Elements of this can be adapted from the model description currently being developed by TOC. This reflection could include the development of a further developed model in subsequent stages. In addition to the agreed processing of the comments valued as insufficient the comments valued as points of attention remain as a recommendation for further processing to make the EIA complete.

5 Ecological comprehensiveness

5.1 Introduction

The description of the ecosystem has been checked by determining if all relevant species and their interactions are included. An evaluation has been conducted to ensure that all potential effects on these species have been adequately considered. Any missing species and effects are identified and documented. The completeness of the species list and description of the food web were deemed important factors. Including this information would ensure an accurate assessment of the effects on the ecosystem as a whole.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Sufficient descriptions of species groups are included.
2. The relevance of each species group is explained.
3. All relevant species to this group in this ecosystem are described.
4. A description of the state of current knowledge on each group is included.

5.2 Review results

The review on this topic does concern insufficient valuation on some of the subsequent criteria besides some points of attention. The comments regarding insufficient valuation are described underneath. Detailed information on the result of the review on this aspect can be found in Appendix D.

Throughout chapter 4.3 Biological Environment of the S03 EIA, the different components of the ecosystem are described. The chapter is divided in species groups. The amount of relevant information varies per species group. Some parts of the ecosystem are missing and only primary effects are discussed. There is no sufficient description of the food web or other important trophic interactions that are required for an accurate analysis of the effects of the activities. This information might not be available, but that, at least, should be mentioned in the chapter describing the biological environment.

There is no description on the biodiversity of the Pacific ocean, the importance of biodiversity or what information is lacking within research. However, the paragraph is more concerned with an introduction to the food web analysis and criticism on the previous EIA, concerning system S02. Methods for a food web analysis can be found in the last appendix of the EIA. This describes various methods for a food web analysis but is not concerned with the outcome. However, without an idea of the food web and how the different species interact, the information describing the ecology of the NPSG is not sufficient for assessing the impact of the ecosystem as a whole.

Where there is information missing or where it is unclear why it is left out or included can be solved by adding one or two sentences on the reason. For example, when there are no numbers on the size of a population available, this should be noted. If this information is included in a different chapter, like the methodologies for gathering data during deployments, referring to the right chapter is needed.

5.3 Processing review results by TOC

The aspects that are valued as insufficient concern a description of the ecosystem which overlaps with the review on the ecosystem approach. Due to this overlap, this review topic was not discussed separately and the relevant remarks on this topic can be found in 4.3.

6 Activities and primary effects

6.1 Introduction

This section of the review covers two closely associated subjects:

- *The description of planned and performed activities by TOC.*
- *Analyses of the primary effects of the activities on the abiotic environment.*

The first subject of this review section is based on a checklist of criteria to which all described activities have been evaluated against. The checklist is based on questions such as what, where, when and how the activities proposed in the project description will be performed. And whether these activities are described to a level where the reader will get a clear understanding of the operation in question.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Are the planned and/or performed activities described?
2. Is the description/explanation of activities detailed enough to create a clear image of TOC are/have plans of- doing during operations of S03 (what, where, when, how)?

The assessment of the second subject is based on a similar, but more comprehensive, checklist of criteria adapted to fit the specific theme. The checklist criteria are listed below and cover the description of the environmental factor in question, relevance to the project, which activities affect the environmental factor in question, description of the current knowledge level about the environmental factor and effects of activities and lastly if the data collected by TOC (either literature study or direct measurements) have been correctly interpreted and analysed in the screening.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Sufficient description of environmental factor.
2. Relevance factor described/explained.
3. Activities potential effect on the assessed factor.
4. Description of the state of knowledge on the factor in question.
5. Correct interpretation/analysis of data.

6.2 Review results

The review on this topic does not concern insufficient valuation on the subsequent criteria. However, some points of attention are addressed as follows. Detailed information on the result of the review on this aspect can be found in Appendix E.

Description of activities

Description of the ongoing and proposed activities covered in TOCs EIA includes in broad strokes three main activity levels:

- Plastic collection operations.
- Plastic extraction operation.
- Environmental monitoring and plastics sampling.

These three activity levels were all deemed as all being effectively described with a level of detail which give a clear understanding of the operations and activities associated with S003.

Although one factor that is missing from the TOCs assessment of their operation is a short description the post collection processing. This subject overlaps with the environmental cost-benefit analyses and is further described in chapter 9.2.

Primary effects of the activities on the abiotic environment

The reviewing team generally agrees with the authors that the activities described by TOC will likely have little to no significant impact on their own on the environmental factors excluded from further analysis.

However, the environmental factors that have been chosen to be excluded from further analysis in the EIA are missing. An explanation as to why this specific factor was important to screen in the first place and on what information the final decision has been based (with the exception of the water quality section which should serve as a template for all other factors in this list on why it has been left out of further assessment).

More detailed assessment and comments per relevant environmental factor from the EIA can be found in appendix F.

6.3 Processing review results by TOC

The review comments concern points of attention and no insufficient valuation points. Therefore, these comments were not discussed further. However, these comments remain as a recommendation for further processing to make the EIA complete.

7 Mitigation measures and duty of care

7.1 Introduction

The subject of this assessment section is based on a checklist of criteria (listed in the subsections below) to which all described activities have been evaluated against their effects on selected species groups encountered through the project. The checklist covers if mitigation measures have been put in place to reduce harm and whether the mitigation measures are adequate to ensure the TOC being in compliance with its duty of care.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Are mitigating measures to prevent harm caused by The Ocean Cleanup's system, sufficient?
2. The Ocean Cleanup's compliance with its duty of care (in conjunction with the legal verification).

7.2 Review results

The review on this topic does not concern insufficient valuation on the subsequent criteria. However, some points of attention are addressed as follows. Detailed information on the result of the review on these topics can be found in Appendix G.

The mitigation measures proposed for specific species and species groups in relation to the potential negative impacts from TOCs S03 project are as expected mainly considered in *section 5 – Potential Environmental Impacts* of the EIA document. However, the general impression of the importance of mitigation and duty of care to ocean environments and species are brought up in section *2.1.4 Mitigation Measures* and throughout the document.

Plankton and neuston

Direct effects on plankton and neuston are all concluded in the EIA to be negligible to low and for each impact category sufficient mitigation measures are being taken. No mitigating measures taken to avoid ingestion of plastic particles by plankton and neuston, but this is rationalized well in the section(s) concerning plankton a neuston.

Fish and fishery resources

There is no mitigation measure recommended for the effects caused by "*Attraction to vessels and strike resulting in injury or mortality*" (p. 158) but vessel strikes are not expected to occur to fish and fishery resources (p. 153). This results in the residual impact significance to be negligible.

All other effects on fish and fisheries are all negligible to low and for these impact categories it is considered that sufficient measures are being taken.

Marine mammals

The consequence of "Exposure to vessel strike resulting in injury or mortality" is rated as 'minor'. This is not correct, as the consequence of a potential strike should be regarded as high. The likelihood, however, is indeed 'remote' (p. 170). Further, the EIA describes a variety of mitigating measures which are being put in place to avoid negative impacts on marine mammals.

Sea turtles

Considering negative impacts to sea turtles TOCs EIA describes a variety of mitigating measures which are being put in place to avoid negative impacts on the species group.

Coastal and oceanic birds

Considering negative impacts to coastal and oceanic birds TOCs EIA describes a variety of mitigating measures which are being put in place to avoid negative impacts on the species group.

Protected areas

The consequence of "*Disturbance of wildlife in marine protected areas from vessel transit*" is rated as 'negligible'. The expert group deemed this as not correct, or at least insufficiently supported in the EIA. Marine protected areas are often specifically determined based of the fragile status of species in that area, so the consequences are very unlikely to be negligible.

However, sufficient mitigation measures are currently being applied according to the current level of knowlegde. The rating of the consequence has to be re-assessed to assure that the mitigation measures deployed remain suitable to avoid negative impacts from the TOC S03 project operation.

More detailed assessment and comments per paragraph can be found in appendix G.

7.3 Processing review results by TOC

The review comments concern points of attention and no insufficient valuation points. Therefore, these comments were not discussed further. However, these comments remain as a recommendation for further processing to make the EIA complete.

8 Recommendations from Waardenburg Ecology

8.1 Introduction

The previous EIA for the S02 system was reviewed by Waardenburg Ecology (formerly Bureau Waardenburg, BuWa) (Bureau Waardenburg, 2022). Recommendations were given for the improvement of the S02 EIA of TOC. The implementations of these recommendations in the new S03 EIA were assessed according to the criteria described hereafter.

In general the criterium for review is:

- Has The Ocean Cleanup sufficiently incorporated the recommendations from Bureau Waardenburg's final report in the EIA for System 03?

8.2 Review results

The review on this topic does not concern insufficient valuation on the subsequent criteria. However, some points of attention are addressed as follows. Detailed information on the result of the review on this aspect can be found in Appendix H.

Most advice from Waardenburg Ecology has been adhered to. The recommendations have been incorporated. The only point of advice that was seemingly not included concerned the recommendation to include an analysis of the gathered data (e.g. plastic collection, bycatch rates, CO_2 emissions, etc.) that shows the net outcome of all aspects of TOC's activities.

8.3 Processing review results by TOC

The review comments concern points of attention and no insufficient valuation points. Therefore, these comments were not discussed further. However, these comments remain as a recommendation for further processing to make the EIA complete.

9 Environmental cost-benefit analysis

9.1 Introduction

This section focusses on the completeness of the environmental cost-benefit analysis of the S03 EIA. Evaluating the environmental costs and benefits associated with TOC's S03 project presents a complex challenge. It necessitates an analysis from an environmental perspective within a dynamic and not fully understood marine ecosystem. Additionally, the assessment must focus on the ecological improvements the project aims to achieve.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Are the environmental benefits of the project described in detail and connected to the relevant activities?
2. Are the environmental costs of the project described in detail and connected to the relevant activities?
3. Is the analysis of the environmental costs vs. benefits connected to an activity balanced and reflected upon?

9.2 Review results

The review on this topic does concern insufficient valuation on the set criteria. Some of the subsequent criteria are valuated as points of attention. The comments regarding insufficient valuation are described underneath. Detailed information on the result of the review on this aspect can be found in Appendix I.

In Chapter 5, titled "Potential Environmental Impacts," a Net Environmental Benefit Analysis (NEBA) from the previous project iteration, S02, is referenced to discuss the environmental costs and benefits. While this chapter presents the environmental aspects in a structured and comprehensive manner, related topics have not been described to the required extent. This information is included in other sections, causing relevant ecological information for the cost-benefit analysis to be dispersed throughout the document.

An EIA should thoroughly articulate the environmental costs and benefits. Although some impacts on specific species and local ecology are covered in the NEBA, the overall effects on biodiversity remain unassessed.

TOC anticipates a net positive environmental impact; however, the EIA lacks clarity and organisation in its references and sourcing. This results in a lack of transparency regarding the information's origins and the methodology employed by the authors to derive their conclusions about environmental costs and benefits.

A consequence analysis should be included as part of the environmental cost-benefit analysis to enhance the EIA. This would confirm that TOC is considering the environmental costs associated with potential operational accidents.

Additionally, when the source of funding is revealed and discussed, this could complete the NEBA. As sources of funding can have indirect, or in some cases direct, effects on the ecological impact and sustainability of the project as a whole.

Other questions could contribute to the comprehensiveness of the assessment:

- Why is the collected plastic shipped to Europe for processing instead of being processed locally?
- And what does TOC do with the collected plastics which cannot be achieved in a processing plant closer to the base of operations, for example in Canada or the USA?

Sweco notes that the only recommendation from Waardenburg Ecology seemingly omitted was the inclusion of an analysis of the gathered data (e.g. plastic collection, bycatch rates, CO_2 emissions) to illustrate the net outcome of all aspects of TOC's activities.

9.3 Processing review results by TOC

During the meeting on October 17, 2024 the second review and advisory report have been discussed. As with the Scientific integrity section, TOC acknowledged the assessment made by Sweco and committed to addressing the feedback constructively in the revised EIA by expanding the sections which were lacking information for full comprehensiveness.

Following two reviews and discussions with TOC, it has been determined that while the necessary information to conduct an environmental cost-benefit analysis exists, it has not yet been published and therefore has not been referenced in the assessment for the S03 project. TOC has included a NEBA from the previous iteration of their system, S02, in the appendix of the EIA. However, this analysis is not directly applicable to the S03 project due to its significantly larger scale. Additionally, the EIA makes claims about the anticipated benefits of the system without providing data to substantiate these assertions.

TOC adequately addressed Sweco's concerns regarding the transportation of collected plastics from the Canadian harbour and the limited literature on the biological environment. Their responses should be incorporated into the relevant sections of the EIA during the document's resubmission.

It is recommended that TOC offer a detailed description of the ongoing process for developing and publishing their novel environmental cost-benefit analysis methodology, as discussed in communications with Sweco. This analysis should be integrated as a key component of future assessments and include a risk analysis that outlines potential project-related risks.

Moving forward, a tailored cost-benefit analysis and/or NEBA specifically for the current project is essential. Conclusions drawn from assessments of previous iterations may not be relevant. Future environmental cost-benefit analyses/NEBAs should also consider the implications of scaling. Specifically, how does the environmental footprint change as the project evolves from a single system to a fleet? Furthermore, what is the projected impact of future scaling in relation to other initiatives aimed at mitigating plastic waste?

Prior to and during the online meeting on October 17, 2024, TOC communicated their commitment to Sweco's recommendations. They have agreed to incorporate their development process for a new environmental cost-benefit analysis in the revised EIA. Additionally, TOC will address the limitations of the current application of the S02 NEBA and clarify how the findings from the previous NEBA relate to the S03 system. Furthermore, TOC will include a brief note in the introduction regarding their funding sources to enhance transparency. As sources of funding can have indirect, or in some cases direct, effects on the ecological impact and sustainability of the project as a whole.

10 Response to criticisms

10.1 Introduction

Despite the extensive evaluation of the TOC's former systems, critical articles and comments to their work and activities have been published[1]. Several sources of criticism have been identified and the implementation of these critics in the EIA have been evaluated. The focus of this evaluation was on the comments on the effectiveness of the Cleanup systems and their long term impact on marine life.

The criteria that have been developed to review the EIA on this topic are as follows:

1. Have the criticisms been incorporated into the EIA?
2. Are the answers to the criticisms sufficient and well substantiated?

10.2 Review results

The review on this topic does not concern insufficient valuation on the subsequent criteria. However, some points of attention are addressed as follows. Detailed information on the result of the review on this aspect can be found in Appendix J.

The criticisms expressed concerned several different topics. The main topics of concern were the inclusion of neuston as a part of the ecosystem, the lack of a detailed and broad cost-benefit analysis, the entrapment of animals and an analysis of the long term effects of the Cleanup systems. The response to these critiques varies per topic.

Some topics have been addressed in other paragraphs of this report. These topics are referred to in Appendix J. Other points of criticism were not relevant to the S03 EIA, such as the note that cleaning the ocean might be redundant as we should focus on preventing that the plastic ends up in the ocean. These are mentioned in the Appendix J but are left out of our assessment as those alternatives are outside the scope of research.

10.3 Processing review results by TOC

The review comments concern points of attention and no insufficient valuation points. Therefore, these comments were not discussed further. However, these comments remain as a recommendation for further processing to make the EIA complete.

[1] Niemand weet welk probleem The Ocean Cleanup eigenlijk oplost - De Correspondent
De plasticvanger van Boyan Slat: ineffectief, peperduur en mogelijk een ramp voor het zeeleven - De Correspondent
The Ocean Cleanup Project Could Destroy the Neuston - The Atlantic
'Succesfoto' van plasticvanger Ocean Cleanup baart biologen zorgen | De Morgen

11 Summary and final conclusions

Context

The Ocean Cleanup (TOC) has developed an updated Ocean Retention System 03 (S03), designed to collect floating plastic from the Great Pacific Garbage Patch located within the North Pacific Subtropical Gyre (NPSG). For the deployment of a single S03 operation in the NPSG a first version of the Environmental Impact Assessment (EIA) has been developed by TOC and delivered in August 2023.

The Dutch Government, the State of the Netherlands, holds a duty of care towards the marine environment, in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). In this context, the Dutch Ministry of Infrastructure and Water Management has commissioned Sweco Nederland B.V. to conduct a review of the Environmental Impact Assessment (EIA) of System 03. This review is recorded in the present report. This report and its findings are based on an initial review of the EIA, prepared by Sweco, a response and a discussion with the TOC. The insights and agreements derived from dialogue between Sweco and TOC through e-mail and digital meetings are processed in this report.

Process and methods

The review was carried out in the following three stages and associated reports:

- First review: initial review on all aspects.
- Second review: advice on processing key aspects.
- Final report: summary and conclusion report.

In the first review the questions that had to be answered were translated into the following thematical topics:

- EIA requirements;
- Scientific integrity;
- Ecosystem approach;
- Information comprehensiveness;
- Activities and the preliminary screening;
- Preliminary screening of activities and affected resources;
- Mitigation measures and duty of care;
- Recommendations from Waardenburg Ecology;
- Cost-benefit analysis;
- Response to criticisms.

For each topic criteria were formulated. Each topic was subsequently reviewed by an expert on that specific topic. For each of the criteria, an expert judgement rating was given with comments and conclusions in a table (sufficient, point of attention or insufficient).

In this way, a structured and transparent evaluation has been ensured, where all aspects of the EIA have been reviewed in a traceable and detailed manner. Further details for each review are included in the review tables in the appendix and the specific chapters per topic in the report.

This stage concerns the reply on the first review by TOC and subsequent advice by Sweco on the topics that were assessed as (partly) insufficient in the initial review.

The reply of TOC was discussed between TOC and Sweco in an online meeting on September 13, 2024. Further details for each review are included in the review tables with subsequent replies in the appendix and the specific chapters per topic in the report.

During the final stage the conclusions on all the reviewed topics were reported. These are described in the chapters of this report. It contains the agreed processing of the comments as a result of communications with TOC resulting from an online meeting between TPC en Sweco on October 17, 2024.

Review results and processing

The Dutch Government, in alignment with, amongst others, its obligations under international law, has a vested interest in ensuring that TOC's activities effectively address their potential impacts on the marine ecosystem.
In conclusion, the review of the EIA for TOC S03 system has revealed several relevant aspects for improvement and enhancement, which need to be addressed.

In de first review stage the findings were valued in the categories insufficient, point of attention or sufficient. The aspects which were (partly) valued as insufficient concern the following:

- Scientific integrity;
- Ecosystem approach;
- Information comprehensiveness;
- Activities and primary effects;
- Cost-benefit analysis.

The review has underscored that while the EIA provides considerable information regarding the operational aspects of the cleanup system, relevant omissions remain on the topic of scientific integrity, information comprehensiveness, ecosystem approach and environmental cost-benefit analysis.

The concerning key comments were discussed with TOC, which resulted in an agreement on processing by TOC. Following the review conducted by Sweco Nederland, TOC has agreed to undertake several important actions to review and enhance their EIA for the updated Ocean Retention System - S03 to conform to the commitments to the Covenant with the Dutch Government.

Scientific integrity

Key findings indicate that the EIA lacks sufficient citations and substantiation for many claims, including those related to emissions and long term environmental impacts. It is essential for TOC to bolster their documentation with peer-reviewed sources and expert insights to enhance credibility and transparency.

TOC has committed to strengthening the scientific integrity of the EIA by improving their referencing and citation practices, ensuring that all claims are substantiated with peer-reviewed sources, traceable data and/or third-party expert judgement. Additionally, they will implement a more rigorous internal review process to prevent conflicts of interest, particularly by ensuring that authors do not review their own work.

Ecosystem approach

The lack of an ecosystem description limits the completeness of the assessment. A more thorough description of the interactions within the marine ecosystem and a detailed analysis of potential indirect effects are necessary to fully understand the implications of the S03 system.
Sweco emphasizes the importance of integrating an ecosystem approach that captures the dynamics of species interactions and the food web.

Recognizing the importance of an ecosystem approach, TOC acknowledged the need for a comprehensive ecosystem description. Due to the lack of knowledge about the North Pacific marine ecosystems they plan to include a schematic that reflects the relationships within the marine ecosystem, ensuring that the EIA reflects upon the interactions among various species and abiotic factors. Despite not implementing an ecosystem approach in the current EIA, TOC will be including a model and a description of their new model for ecosystem-based approach in the revised version of the EIA developed for S03.

Information comprehensiveness

Two questions which need to be added in the activity sections in updated versions of the EIA are 1) "*Why is the collected plastic shipped to Europe for processing instead of being processed locally*?" and 2) "*What does TOC do with the collected plastics which cannot be achieved in a processing plant closer to the base of operations, for example in Canada or the USA?*"

The plastic is shipped to Europe for processing due to the following reasons: There are no local recyclers in Canada that deal with such a specific treatment of the fibrous plastic (mainly fishing nets) that are collected. There are currently few recyclers in the world that do this process. TOC is currently negotiating with recyclers closer to the project area (in the U.S.A. and Chile), but due to availability, expertise, legal requirements (permits) and conditions, to date TOC has only been able to work with recyclers from Europe (in the Netherlands and Denmark). TOC further notes that we are currently conducting a life cycle assessment to identify the most environmentally suitable processing framework for our collected plastic waste. This work is expected to last through 2025.

TOC agreed to enhance the comprehensiveness of the information presented in the EIA. This includes addressing gaps related to the processing of collected plastics, specifically clarifying the rationale for transporting plastics to Europe rather than processing them locally. Furthermore, they will incorporate responses to Sweco's concerns about the biological environment into the updated EIA.

Environmental cost-benefit analyses

The review also highlights the need for a clearer articulation of the environmental costs and benefits associated with TOC's S03. Developing a tailored and transparent environmental cost-benefit analysis methodology is crucial, especially as future iterations may be scaled up. This should also include a comprehensive evaluation of operational risks and a clear discussion of funding sources, as these factors can significantly influence the project's total ecological impact.

TOC will include a detailed description of their process for developing a new environmental cost-benefit analysis methodology. This will include a tailored analysis for future projects, focusing on potential ecological impacts and the implications of scaling up their operations. This will, however, not include a full cost-benefit analysis or NEBA for the S03 system, but rather a reflection on in which instances the NEBA developed for the S02 system can and cannot be used as a proxy in estimating ecological impact from the larger S03 system.

Finally, TOC will enhance transparency by clarifying the source of their funding in the EIA and discussing how it may impact the ecological sustainability of their operations.

Remaining aspects

The comments that are valued with a point of attention were not discussed further. However, these comments remain as a recommendation for further processing by TOC to make the EIA complete.

Final conclusions

Throughout the review process, TOC actively engaged with Sweco to identify and address the most pressing issues highlighted in the initial and advisory report. They expressed a commitment to incorporating these recommendations into the revised EIA to ensure compliance with the Dutch Government's requirements. By processing these recommendations the underlying questions that are part of the scope of the project can be answered in a positive way.

The main question that has to be answered is: *does The Ocean Cleanup take the necessary precautions that can reasonably be expected of it to prevent damage to the marine environment, to species present in the area and to the food web as a result of the deployment of the System?*

The answer to this question is positive in the context of the commitment of TOC to incorporate the agreed additions into the revised EIA.

Appendix A - Review table EIA requirements

In relation to EIA there are two types of requirements:

A. Requirements for the information that an EIA must contain:
   1. A description of the project with information on the location, design, size and other relevant characteristics of the project.
   2. A description of the likely significant environmental effects of the project.
   3. A description of the characteristics of the project and/or the measures planned to avoid, prevent or reduce the likely significant adverse environmental effects and, where possible, compensate for them.
   4. Description of the reasonable alternatives examined by the client that are relevant to the project and its specific characteristics, indicating the main reasons for the chosen option, in light of the environmental impacts of the project.
   5. A non-technical summary of the information referred to in points (1) to (4).
   6. Any additional information referred to in Annex IV Directive 2014/52/EU which is relevant to the specific characteristics of a particular project or type of project and to the environmental aspects likely to be affected by it.

B. Requirements for the assessment, namely that the direct and indirect significant effects of a project are appropriately identified, described and assessed on a case-by-case basis in terms of the following factors:
   1. The population and human health.
   2. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.
   3. Land, soil, water, air and climate.
   4. Material goods, cultural heritage and the landscape.
   5. The relationship between the factors mentioned under 1. to 4.

Score: insufficient (i) / point of attention (p) / sufficient (s)

A. Requirements for the information that an EIA must contain	Score	Comments/conclusions
1. A description of the project.	s	2.1 of EIA gifs detailed description.
2. A description of the likely significant environmental effects of the project.	s	This is not a content related assessment, but based on section 4.1 it is clear that a preliminary screening has been done. Chapter 5 describes possible significant environmental effects of the project.
3. A description of the characteristics of the project and/or the measures planned to avoid, prevent or reduce the likely significant adverse environmental effects and, where possible, compensate for them.	s	Chapter 2 describes that, based on extensive testing and research, as much as possible is already being done to prevent effects. Chapter 6 describes that The Ocean Cleanup has prepared and implemented an EMP to identify and describe mitigation measures employed to reduce or eliminate the potential environmental impacts identified in this EIA. The EMP is continually updated as data and observations are made during the campaigns.

A. Requirements for the information that an EIA must contain	Score	Comments/conclusions
4. A description of the reasonable alternatives that the client has investigated.	s	2.5 of EIA and section 2.1.4.
5. A non-technical summary.	p	Due to the technical nature of the project and the complexity of the possible effects, the summary is quite technical in nature.
6. Any additional information referred to in Annex IV Directive 2014/52/EU which is relevant to the specific characteristics of a particular project or type of project and to the environmental aspects likely to be affected by it.	s	Chapter 2 describes a lot of relevant/additional information based on practical experiences.

B. Requirements for the assessment on the following factors	Score	Comments/conclusions
1. The population and human health.	p	Toxicity to humans and ecosystems is mentioned in 5.2.1, but human health in general is not. This positive effect is hardly mentioned. Although it is an indirect effect, it may be worth considering it alongside any possible negative effects.
2. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.	p	It is not entirely certain to what extent biodiversity has been adequately assessed given the conflicting notes in Chapter 4 and Chapter 6:No significant impacts to biodiversity are expected from The Ocean Cleanup's activities (4.3.8). Biodiversity was included in the screening process and it was determined that there is still not enough information at this time to fully address biodiversity impacts from the S03 (chapter 6).
3. Land, soil, water, air and climate.	s	Relevant aspects are determined in chapter 4.
4. Material goods, cultural heritage and the landscape.	s	Relevant aspects are determined in chapter 4.
5. The relationship between the factors mentioned under 1. to 4.	x	This has been assessed under other topics Assessment from resulting from other topics: The relationships between the factors are not mentioned. As the ecology is described as separate parts, some description of the food web is missing, secondary/indirect effects are not included.

Appendix B - Review table scientific integrity

Criteria:

1. Sufficient amount of scientific literature cited: sources of data, previous studies and other supporting information is cited. Statements, interpretations and conclusions are supported by literature.
2. (Most)recent literature cited: recent literature is cited when available.
3. Sufficient quality of literature cited: literature from peer-reviewed scientific journals or recognized authorities or institutes.
4. Correct interpretation of important literature: data or conclusions from literature were relevant, correctly interpreted and not taken out of context.
5. Comprehensive: no important studies or data were missed

Score: insufficient (i) / point of attention (p) / sufficient (s)

EIA section	1	2	3	4	5	Comments/conclusions
C4 Description of Existing Environment						
Preliminary screening of activities and affected resources	s	s	s	s	s	Sufficient: Some statements missing literature but likely of minimal impact to overall conclusions
Air quality	s	s	s	s	s	Amount of air emissions by TOC would be good to mention in comparison to the Vancouver air quality stats (now only CO_2).
Sediment quality	s	s	s	s	s	Sufficient
Water quality	p	s	s	s	s	Reference for minimal effects ballast water.
Benthic communities	s	s	s	s	s	Sufficient
Archaeological resources	p	s	s	s	s	Reference for lack of archaeological resources.
Human resources, land use, and economics	s	s	s	s	s	Sufficient
Recreational resources and tourism	s	s	s	s	s	Sufficient
Physical oceanography	s	s	s	s	s	Sufficient
Data sources	s	s	s	s	s	Sufficient
Biological environment	p	s	s	s	p	Intro - Only two papers cited. Could use more literature to support. 'other studies' – needs more than one (non-review) citation. Reference with year needed for all IUCN/SARA protection status. Poorly supported by literature in few sections. Hard to judge if it would impact conclusions. Biodiversity section problematic. There is a lack of information available but should be addressed better
Plankton	p	s	s	s	p	Multiple statements without references. Several times "studies" but citing only one study.

EIA section	1	2	3	4	5	Comments/conclusions
Neuston	s	s	s	s	s	Note different performance types of nets!
Fish/fishery resources	p	s	s	s	p	Multiple statements without references
Marine mammals	p	i	s	s	p	Multiple statements without references. Distribution and population info needs more recent data/references.
Sea turtles	p	s	s	s	s	Point of attention
Coastal and oceanic birds	s	s	s	s	s	Sufficient
Protected areas	s	s	s	s	s	Sufficient
Biodiversity	i	i	i	i	i	Not well supported, not well known. They note research is continuing on this subject. In the current wording it is too easily dismissed.
Social environment	s	s	s	s	s	Sufficient
Commercial and military vessels	s	s	s	s	s	Sufficient
C5 Potential Environmental impacts						
Impact assessment methodology	s	s	s	s	s	Sufficient
Determination of impact consequence	s	s	s	s	s	Sufficient
Determination of impact likelihood	s	s	s	s	s	Sufficient
Potential impacts from project activities						
Long term impacts from project plastics removal	p				p	Appendices not reviewed.
Potential impacts on plankton and neuston	s	p	s	i	p	New paper missed: Chong et al. 2023 (May) High concentrations of floating neustonic life in the plastic-rich North Pacific Garbage Patch. Note different net types used. Effects on neuston not clearly described. Entanglement section is a confusingly long chapter, with inaccurate headings.
Potential impacts on fish and fishery resources	s	s	s	s	i	Population impacts dismissed but no population data or estimates were included.
Potential impacts on marine mammals	p	i	s	s	s	No ref for statement of low density of marine mammals in the area. In combination with dated population data in ch.4. Noise and lights: little to no recent lit. Lots more available including reviews. e.g. Carlos M. Duarte et al. ,The soundscape of the Anthropocene ocean. Science371,eaba4658(2021).DOI:10.1126/science.aba4658. Multiple statements without references (specifically section fuel spill).
Potential impacts on sea turtles	p	s	s	s	s	Multiple statements without references. Population/density data is missing. Minor points, unless population/density data would make a big difference. Refs needed there.
Potential impacts on coastal and oceanic birds	p	s	s	s	s	Couple minor refs missing.
Potential impacts on protected areas	s	s	s	s	s	Sufficient
Potential impacts on commercial and military vessels	s	s	s	s	s	Sufficient

Appendix C - Review Table Ecosystem approach

EIA section	1	2	Comments/conclusions
C4 Description of Existing Environment			
Outreach of the ecosystems that are concerned	i	i	In general the ecosystems are only mentioned on the level of the oceanic currents. It is not quite clear what the global boundaries of these currents are and what spatial relation of ecosystem of the collection area with these currents is since this seems to be different ecosystems since the garbage patches are outside the currents. A more detailed spatial inside should be given in the different ecosystems, there outreach and interactions.
Interaction between species on ecosystem level	i	i	To determine the possible effects on ecosystem level, a description of the interaction between de different species groups is missing in this chapter. In appendix E there is a figure included that gives some inside, but there must be more information available to make a more sophisticated description of the ecosystem food chain. A conclusion will be that these interactions are complex and only qualitatively known on a global scale, but this is important as a bridge to the effect-analysis. Lack of knowledge leads to uncertainties which are part of the effect-analysis. A description of the biotic relations should be added with a review on the knowledge gabs.
Abiotic-biotic relations	i	i	A description of the biotic-abiotic relation is missing in the description. This is important because the possible effect can be the result of the indirect effect of species. Air quality, sediment quality and water quality are mentioned in relation to the possible effect but where this connect to the food chain is missing. A description of the abiotic-biotic relations should be added.
C5. Potential Environmental Impacts			
Effects on ecosystem level	i	i	In this chapter there is no real analysis of the effects on ecosystem level. Because of these indirect effects via the food chain or abiotic are missing. This is complex and partly unknown, but should be addressed and valued on possible importance, because this otherwise leads to uncertainties on the possible effects on a large scale. In the method the effect on ecosystem level is part of the assessment of the level of impact intensity but cannot be assessed because the analysis on this lever is missing. A qualitative analysis should be added even if it is global. A reference to the model analyses in appendix E is not enough. It is a good intention to get a better inside in the effects in the future, by developing these models, but this does not contribute to the conclusion of the EAI in this moment.
C6 Conclusions			
Effects on ecosystem level	i	i	Mentioned is that the impact analysis was performed on a resource-by-resource basis and could not fully consider impacts at the ecosystem level. This conclusion is not sufficient in relation to the comments on chapter 5. If this conclusion only describes the complexity and intentions to model this in the future the presents uncertainties remain and it cannot be excluded that the impact is acceptable. There should be some conclusion added concerning the impact on ecosystem level

Appendix D - Review Table Ecological comprehensiveness

Criteria:

1. Sufficient descriptions of species group are included.
2. The relevance of each species group is explained.
3. All relevant species to this group in this ecosystem are described.
4. A description of the state of current knowledge on each group is included.

Score: insufficient / point of attention / sufficient

EIA section	1	2	3	4	Comments/conclusions
C4 Description of Existing Environment					
Biological environment	i	i	p	i	Intro was not sufficient and incorrect (see comments). No general description, no mention of its importance or what information is coming and why. No mention of what information would be relevant but is missing and how this has been solved! No summary of the more important groups that will be encountered while reading (such as flotsam-associated fish).
Plankton	i	i	i	i	Immediately in-depth, no structure, should contain small description of plankton and the communities. Description of phytoplankton is missing, quantification and role in the food web needs to be described!
Neuston	s	s	s	i	Why choose the 1 cm definition and not the 1 m?
Fish/fishery resources	p	i	s	i	Intro is missing, with a description on the importance of these groups and they are included. Why are the coastal and estuarine species included? Market squid is not a fish!! Why combine fish and fishery resources? Structure requires attention.
Marine mammals	p	p	s	i	Explanation on the big difference between sightings during S001 and S002? This part suddenly contains a description of legislation, other parts do not contain such a description. Is that the relevance of this group?
Whales, Dolphins and Porpoises	s	p	s	s	Why are the auditory and vocalization ranges of these species included?
Seals and Sea Lions	s	s	s	s	Sufficient
Sea turtles	s	s	s	s	Sufficient
Coastal and oceanic birds	s	s	s	s	Good introduction, relevance of some information is not clear.
Coastal birds	s	i	s	s	Why is this group relevant?
Oceanic birds	s	s	s	s	Sufficient
Protected areas	s	s	s	s	Sufficient

EIA section	1	2	3	4	Comments/conclusions
Biodiversity	i	i	i	i	Biodiversity should include remarks on the smaller organisms that are impacted, the abiotic conditions that are affected and the secondary effects that can occur. The assessment of these factors should be described in the next chapter. The way this part is formulated, the impact assessment has already been included, is getting ahead of the facts. The assessment that is quoted is the chapter hereafter. In the table 4-1 the effect on the biodiversity is stated to be unclear. In the paragraph on biodiversity the effects are described as not significant. This is confusing.

Additional criteria, missing	1	2	3	4	Comments/conclusions
Benthic communities	i	i	i	i	Removal of plastic would indeed help these communities, but could there also be detrimental consequences to the BC
Food web	i	i	i	i	No food web description found! Where are the numbers on the productivity of the area? It is mentioned that the area is important for production, but it is not quantified.
Observations	i	i	i	i	Description of methodologies is missing, refer to the right chapter.

Appendix E - Review Table Description of activities

Criteria:

1. Activities described?
2. Detailed description/explanation of activities (what, where, when, how).

Score: insufficient / point of attention / sufficient
Sufficient: Positive conclusion, minus possible small and unimportant points.
Point of attention: Information not well substantiated but probably no influence on conclusion/ No reference.
Insufficient: Incomplete info/ not well substantiated with potential effect on conclusion/untrue.

EIA section	1	2	Comments/conclusions
C2.1 Project history and overview (Completeness check of activities and its description into detail)			
2.1.2. Plastics Collection Operations (p.19-21)	s	s	Activities described into detail including factors that determine what, where, when, how activities take place (including photos of collection operations).
2.1.3. Plastic Extraction Operations (p.22-25)	s	s	2.1.3. Execution of extraction operations is described in the relevant paragraph in a very similar way as 2.1.2. Execution of collection operations. This is good and an easy read. Activities described into detail including factors that determine what, where, when, how activities take place (including photos of extraction operations)
2.1.6. Environmental Monitoring and Plastics Sampling (p.29-31)	s	s	Quote from EIA p. 29 "*Environmental monitoring was performed during Campaigns 1 through 12 to better understand the existing plankton and neuston communities, relative abundance of neuston, and what species tend to co-accumulate with plastics*" This is good, as neuston is the species group that seems to be most effected by TOC's activities (For more about this, I also refer to the critical analysis component of our review). Activities described into detail (2.1.6.1. Bycatch Analysis, 2.1.6.2. Plankton and Bongo Net Sampling, 2.1.6.3. Manta Net Sampling, 2.1.6.4. eDNA Sampling and 2.1.6.5. Plastics Research).

Additional criteria, missing	Comments/conclusions
Post collection processing	What does TOC do with the collected plastics? And why is it shipped to Europe for processing instead of being processed locally?

Appendix F - Review Table Effects on the Abiotic Environment

Criteria:

1. Sufficient description of environmental factor.
2. Relevance factor described/explained.
3. Effect on the assessed factor.
4. Description of the state of knowledge on the factor in question.
5. Correct interpretation/analysis of data.

Score: insufficient / point of attention / sufficient

EIA section	1	2	3	4	5	Comments/conclusions
C4 Description of Existing Environment						
Preliminary screening of activities and affected resources						
Air quality	p	s	s	p	i/p	Reviewer agrees with the conclusion that the two vessels pulling the collection device likely will have a negligible effect on the air quality, especially when deployed in an area which is not already under pressure from other emission sources. Source of data for calculating emissions is lacking, model for emissions calculations is lacking. These should be included for transparency.
Sediment quality	i	i	p	s	s	No description of sediments within working area, nor its function/role in an ecosystem. Why are sediments important to assess or at least screen for importance in this project environment? Sinking of plastics to the bottom is mentioned, but not the potential effects of an accidental loss/sinking of collection device. Positive effects of collecting plastics on the sediment quality are mentioned. A short introduction to why screening for effects on sediments is important should be added as the role of sediments in a marine ecosystem is not explored further.
Water quality	s	p	s	s	s	Well described section which should serve as a template for how all other sub-sections in this main section should be structured. Well referenced, potential effects and consequences in different environments described, legal system described. TOC writes "*The extent and persistence of water quality impacts from a small diesel fuel spill would depend on the meteorologic and oceanographic conditions at the time and the effectiveness of spill response measures,"* effects would also depend on geographical location; open water, close to shore, in protected areas, within harbour. This should be added to the beforementioned sentence.

EIA section	1	2	3	4	5	Comments/conclusions
						Missing an introduction to water quality and its importance. But overall this section clearly describes the potential effects of the project on water pollution in the operating area.
Benthic communities	i	i	p	s	s	How do they define benthic communities within TOC? No description of benthic communities withing working area, nor their function/role in an ecosystem. Why is it important to assess or at least screen for importance of benthic communities in this project environment? Effects of sinking plastics to the bottom is mentioned (section 4.1.4), but not the potential effects of an accidental loss/sinking of collection device on benthic organisms and communities. Positive effects of collecting plastics on the sediment quality are mentioned. Background information and definition is lacking. Reviewer agrees with the conclusion of negligible effect on benthic communities during normal operation but misses a consequence analysis for accidental spills.
Archaeological resources	s	s	s	p	s	TOC claims "*Mobilization is expected to occur in the Victoria area in a developed, industrial area with no known archaeological resources nearby.*" But cites no sources to support the claim. Effects of sinking plastics to the bottom is mentioned (section 4.1.5), but not the potential effects of an accidental loss/sinking of collection device on archaeological resources. Positive effects of collecting plastics on the sediment quality are mentioned. Reviewer agrees with the conclusion of negligible effect on archaeological resources during normal operation, but still misses a consequence analysis for accidental spills.
Human resources, land use, and economics	p	s	i	s	p	Depending on the size of the port and the timing of the activities the two additional vessels from TOC may take up port space for vessels with other economic interests. This is not explored and described in detail in the EIA. TOC describes the end process in Canada as "Collected plastics will be transported to the Victoria area in sealed containers before being forwarded to The Ocean Cleanup's facility in the Netherlands." Why cannot the plastic be processed locally/regionally? A description of the need to ship collected plastic across to NL/DK is warranted as this would both increase pollution from shipping and the risk of new plastic spills. Information is partially provided and framed in favour of TOC and its project, but an assessment/description of the process following the collection of the plastic is missing and should be included.
Recreational resources and tourism	s	s	s	s	s	Reviewer agrees with the conclusion of negligible effect on recreational resources and tourism during normal operation as most tourism activities (safari, fishing etc.) take place closer to shore.

EIA section	1	2	3	4	5	Comments/conclusions
Physical oceanography	p	p	s	p	s	Due to the volatile state of pelagic marine waters the effects of dragging a small (in relation to the environment) floating net through an open marine environment will have no immediate, nor lasting effects on the physical oceanography. Reviewer agrees with the conclusion of no-to negligible effect on physical oceanography, but the section is lacking the "why". Why was this factor considered? Why has it been screened out of the EIA?

Additional criteria, missing	Comments/conclusions
Synergistic and additive effects excluded from analysis	How do the disturbance factors affect the biological and abiotic factors in conjunction?
Potential effects on coastal ecosystems	What are the considerations of a fuel/oil or plastic spill close to shore as the vessels are traveling from port?
Consequence analysis (damages/accidents/shipwreck) missing	There is no reflection to be found over the potential impact of spills and other incidents or accidents. What would happen to a local marine environment in case of an accident/shipwreck where fuel, other chemicals and/or large amounts of plastics are released at once? What would be the effects of a broken net releasing plastics close to shore? A consequence analysis and a reflection over the potential of accidents would strengthen the EIA and demonstrate their ability to reflect on their broader impact.

Appendix G - Review table Mitigation and duty of care

Criteria:

1. Are mitigating measures to prevent harm caused by The Ocean Cleanup's system, sufficient?
2. The Ocean Cleanup's compliance with its duty of care.

Score: sufficient (s)/ point of attention (p)/ insufficient (i)

Sufficient: Positive conclusion, minus possible small and unimportant points.
Point of attention: Information not well substantiated but probably no influence on conclusion/ No reference.
Insufficient: Incomplete info/ not well substantiated with potential effect on conclusion/untrue.

EIA section	1	2	Comments/conclusions
C5 Potential Environmental impacts			1. Reported effects on these species, as a result of TOC system (impact summary p.121) 2. Mitigating measures & possible missing mitigating measures
Potential impacts on plankton and neuston (p. 133-149)	s	s	1. Entanglement in the S03 or accumulated debris resulting in injury or mortality during plastics collection and extraction operations. (Overall losses to zooplankton are expected to be <1%, while ichthyoplankton losses are projected to range from <1% to <3%. Given the relatively high concentration of plastic particles in the NPSG, the deployment likely will result in an increased level of plastic ingestion or adsorption by plankton and neuston. (but the effect is negligible to low) also noted that potential ingestion of macro- and microplastics by filter-feeding neuston needs to account for particle size distribution (p. 144). Attraction to the S03; ingestion of congregated plastics resulting in injury or mortality, behavioural modifications (e.g., suppress diel migration, attraction to System) from lights, Diesel fuel exposure, including ingestion, Entanglement in the S03 or accumulated debris resulting in injury or mortality during plastics collection and extraction operations, Attraction to the S03; ingestion of congregated plastics resulting in injury or mortality, behavioural modifications (e.g., suppress diel migration, attraction to the System) from lights, Diesel fuel exposure, including ingestion. 2. Mitigating measures see p. 148. NOTE: Attraction/Ingestion of plastics: No mitigation measures are recommended to avoid ingestion of plastic particles by plankton and neuston. The plastics ingested by plankton and neuston would be microplastics that are not captured by the S03, which can only capture macroplastics due to the mesh size of the netting (p. 145). Other mitigating measures that are not mentioned in the table on p. 148: During plastics extraction operations, the S03 is towed at a slower speed and the opening between the

EIA section	1	2	Comments/conclusions
			wings is reduced to the width of one vessel, less than 5 m, which significantly reduces the area swept by the System, possibly also reducing the amount of plankton and neuston retained in the RZ (p. 143) System design changes, including the use of larger floats with more buoyancy along the top of the wings, may reduce the amount of overtopping of water and potentially of plankton and neuston over the wings. In addition, the mesh size of the wings has increased which may allow more plankton and neuston to flow through the wings (p. 141). Other references: p. 135, 137 Effects on plankton and neuston are all negligible to low and for each impact category sufficient measures are being taken. No mitigating measures taken to avoid ingestion of plastic particles by plankton and neuston but this is well supported by arguments and approved.
Potential impacts on fish and fishery resources (P. 149-160)	p	p	1. Entanglements or entrapment with the deployed S03, Attraction to the S03 and ingestion of plastics collected, Attraction to vessels and strike resulting in injury or mortality, behavioural modifications (e.g., evasive swimming, disruption of activities, departure from the area) due to noise exposure; avoidance of noise sources (e.g., tow vessels), Attraction to vessels and lights, Diesel fuel exposure, including ingestion (p. 157, 158, 159). 2. Mitigating measures see p. 158, 159. There is no mitigation measure recommended for the effects caused by "*Attraction to vessels and strike resulting in injury or mortality*" (p. 158) but vessel strikes are not expected to occur to fish and fishery resources (p. 153).resulting in the residual impact significance to be negligible. All other effects on fish and fisheries are all negligible to low and for these impact categories sufficient measures are being taken.
Potential impacts on marine mammals (p.160-173)	s	s	1. Entanglement in the S03 or accumulated debris resulting in injury or mortality during plastics collection and extraction operations, Attraction to the S03; ingestion of congregated plastics resulting in injury or mortality, Exposure to vessel strike resulting in injury or mortality, behavioural modifications (e.g., evasive swimming, disruption of activities, departure from the area) from noise exposure; avoidance of noise sources (e.g., tow vessels), Entanglement with or ingestion of debris accidentally lost, Diesel fuel exposure, including inhalation of vapours, ingestion, and fouling of baleen. 2. Mitigating measures see p. 170-173. The consequence of "Exposure to vessel strike resulting in injury or mortality" is rated as "minor" and this is not correct, this is definitely high. The likelihood is indeed "remote" (p. 170). Other than that, lots of/a variety of mitigating measures are being taken, good.

EIA section	1	2	Comments/conclusions
Potential impacts on sea turtles (p.174-189)	s	s	1. Entanglement or entrapment with the deployed S03 or accumulated debris, Attraction to the S03; ingestion of congregated plastics resulting in injury or mortality, Injury or mortality resulting from a vessel collision with a sea turtle, behavioural modifications (e.g., diving, evasive swimming, disruption of activities, departure from the area) from noise exposure; avoidance of noise sources (e.g., tow vessels); attraction to light, Entanglement with or ingestion of debris accidentally lost, Diesel fuel exposure, including inhalation of vapours and ingestion. 2. Mitigating measures see p. 185-188. Lots of/a variety of mitigating measures are being taken, good.
Potential impacts on coastal and oceanic birds (p.189-199)	s	s	1. Entanglement or entrapment with the deployed S03, Attraction to the S03; ingestion of congregated plastics resulting in injury or mortality, behavioural modifications (e.g., disruption of activities, departure from the area) from noise exposure; avoidance of noise sources (e.g., tow vessels), Injury or mortality resulting from collision with a vessel due to attraction from lights, Entanglement with or ingestion of debris accidentally lost, Diesel fuel exposure, including inhalation of vapours and ingestion. 2. Mitigating measures see p. 196-198. Lots of/a variety of mitigating measures are being taken, good.
Potential impacts on protected areas (p.199-202)	p	p	1. Disturbance of wildlife in marine protected areas from vessel transit, Exposure to diesel fuel, fouling of habitat 2. Mitigating measures see p. 201. The consequence of "*Disturbance of wildlife in marine protected areas from vessel transit*" is rated as "Negligible" and I doubt that this is correct. Marine protected areas are often specifically determined based of the fragile status of species in that area, so the consequences are very unlikely to be Negligible. However, sufficient mitigation measures are taken. But the rating of the consequence has to be reviewed to assure that strict mitigation measures remain in the future.

Potential impacts on commercial and military vessels (p.202-204)	-	-	The Ocean Cleanup implements the following mitigation measures to reduce potential impacts to commercial and military vessels from vessel collisions:
			• Vessel operations – Vessel speeds are kept to a minimum for specific operations, as follows:
			  • Between shore and the NPSG, transit vessels travel at slow speeds (<14 knots); and
			  • Tow vessels in the NPSG travel at extremely slow speeds (0.5 to 2.5 knots).
			• Monitor notifications – Vessels monitor NOTSHIP notifications prior to and during transit from the port.
			Despite the TOC considering their S003 project having negligible effects on commercial and military vessels, they still propose mitigation efforts to ensure the safety of said vessels.

Appendix H - Review table Recommendations from Bureau Waardenburg

Criterion:

- Has The Ocean Cleanup sufficiently incorporated the recommendations from Bureau Waardenburg's final report in the EIA for System 03?

Score: sufficient (s)/ point of attention (p)/ insufficient (i)

Sufficient: BuWa's recommendations well incorporated (positive conclusion), minus possible small and unimportant points.
Point of attention: BuWa's recommendations not well incorporated but probably no influence on conclusion/ No reference.
Insufficient: BuWa's recommendations not incorporated/ not well substantiated with potential effect on conclusion/untrue.

Recommendation from BuWa	1	Comments/conclusions
Monitoring Assessing potential impacts remains essential, because the low impact results of TOC activities are partially due to favourable conditions (and these conditions can of course, change) (p. 21 review BuWa)	s	This recommendation is given by BuWa, after the following question stated by the Ministry "*Is The Ocean Cleanup taking the necessary precautionary measures to reduce their environmental impact?"* which was answered by BuWa with a "Yes". TOC has successfully incorporated this advice from BUWA in their 2023 EIA. As described in the mitigating measures, for relevant species there has been ongoing monitoring such as visual monitoring and use of visual cues.
Progress is made with filling in knowledge gaps (e.g., EwE model) and should be continued.	s	This recommendation is given by BuWa, after the following question stated by the Ministry "*Is The Ocean Cleanup furthering technical and environmental optimisation of their missions in the future?"* which was answered by BuWa with a "Yes". Progress continuously made by TOC.
Attention should be given to **the interpretation of analysed data**: what does it mean for the project and how can operations be optimized? In this way, lessons learnt can continue to feed the learning process.	s	TOC paid attention to this recommendation. Verifiable that further neuston and plankton data is collected in section "*Potential impacts on plankton and neuston (p. 133-149)*" and in "*Appendix D Supporting Neuston Technical Data*".
Advise to the Ministry to stay actively involved in this process and consult independent experts for evaluation of the plans in the context of ecological and juridical developments.	s	Advise applied, both the Ministry and independent experts are actively involved.
Implementation of **lessons learnt** from all S02 Ocean Cleanup campaigns (including the ones that were not yet	s	On p. 128/129 of the EIA is stated "*The data collected, observations made, and lessons learned during the previous campaigns have been used to improve the scale-up S03 design, using an adaptive management approach. This EIA includes the data collected, findings, and*

Recommendation from BuWa	1	Comments/conclusions
analysed for the updated final EIA) ready for the elaboration of the next EIA.		*observations from the 12 previous S002 campaigns*". In "*Table 4.1 Preliminary screening of potential impacts",* impact conclusions are drawn, based on the lessons learned and in chapter 4 "Description of Existing Environment" an evaluation of each resource is given.
It is recommended to have the data analyses (e.g. bycatch rates, CO2 emissions, plastic collection) that show how net environmental benefit is improved with each new 'technological iteration'.	p/i	*In "Table 5.7 Summary of primary bycatch fish species from Campaigns 1 through 12*" on p. 150, only the number of cruises is mentioned and nothing about improvement with each new 'technological iteration' or improvement compared to previous cruises. BuWa's recommendations not well incorporated but probably no influence on conclusion/ No reference.

Appendix I - Review table Costs and benefits

Benefit definition:

- Positive impact on ecology, biodiversity and/or human sphere (economy, health, etc.)
- Positive impact on the projects resource consumption (money, time, etc.).

Cost definition:

- Negative impact on ecology, biodiversity and/or human sphere (economy, health, etc.)
- Negative impact on the projects resource consumption (money, time, etc.).

Criteria:

1. Are the benefits of the project described in detail and connected to the relevant activities?
2. Are the costs of the project described in detail and connected to the relevant activities?
3. Is the analysis of the cost vs. benefit connected to an activity balanced and reflected upon?

Score: insufficient / point of attention / sufficient

Factor	1	2	3	Comments/conclusions
RnD	s	s	s	Iteration based development give technicians and engineers opportunity to learn from previous iterations. This is well described. It also described how the learning process from previous iterations have aided in developing a system which is aimed at being more 'gentle' to the species/ecosystem it encounters during operations. Iteration based development is also cost and time saving for the project. Mitigation efforts also being tested and improved. Mostly described in the introduction and background sections. Highlights the improvements done in design, safety and efficiency through iterative development.
Operational	s	p	s/p	Cost/impact from accidental fuel spills and loss of debris covered in table ES-3. Unclear if this covers costs and benefits of transporting collected plastics to processing plants in NL & DK. Handling of cost in the form of bycatch is described in the section about operations. Emission costs are claimed to be similar to their older passive system due to the requirement of maintaining and controlling the passive system will result in similar boat traffic. However, there are no calculations for this claim available to reviewers, and it is unclear if the increase in fuel usage from towing heavy nets have been included in the model.

Factor	1	2	3	Comments/conclusions
				Costs of discharges and waste water has been covered in the EIA. The benefits of the implementation of active propulsion compared with passive drift and benefits of the net design are well described with references to previous EIAs and other rapports. Same goes for the costs of waste water and accidental spills of fuel.Calculations/proof of costs of emissions are lacking, despite claims that active propulsion results in similar carbon footprint.Other accidental costs are lacking, such as accidental spillage/leakage of plastics. A consequence analysis should be included with even low likelihood accidents. Also, a section reflection on the mechanical wear and tear of macroplastics as a result of collection activities would strengthen the rapport.
Ecological	s/p	s/p	s	Lacking data on impact on biodiversity made the author exclude biodiversity from the EIA. Table ES-3 gives an overview of the impact and consequences which can be used as proxy for benefit and cost. Handling of cost in the form of bycatch is described in the section about operations and in section 5 - potential environmental impacts. Removal of plastics is a cost to some species who rely on debris for procreation, hiding places and passive movement/ dispersal and some bycatch is unavoidable. However, removal of plastics is considered a net positive for marine life at risk of the negative consequences. Both potential benefits and costs to marine environments are well described in section 5 and in table ES-3. Effects on biodiversity has been excluded, but it has been done purposefully and has been supported by reflection in the rapport.
Post collection processing	i	i	i	Transport of collected plastic to DK and NL is described, but not justified with anything other than the statement "*Feasible options for further processing of the plastics continue to be assessed.* ". Further processing is not described. Why is the plastic not processed locally? The reasoning behind this decision should be included. Shipping from the Canadian west coast to Europe creates more climate gas emissions and the further the travel of a 'product' the greater the chance of an accidental release back into the environment. What happens to the plastic once it reaches NL/DK? This should be described.
Socio- economic (health, economy, etc.)	p	p	p	In section 4 of the EIA the authors tackle socio-economic factors. These are mainly viewed as positive by TOC. Although, the information which the benefits and costs are based on are not clear. Although, it is likely that removing plastics from the local and reginal

Factor	1	2	3	Comments/conclusions
				marine environment is socio-economically beneficial (less toxins in the environment, cleaner environment for tourism, healthier fisheries, etc.) the information is lacking in the EIA to make any confident statements. Lacking referencing and clear sources for their claims.
Geographic	p	s	s	Mostly well covered, but a section about the impact on costal systems should be added
Other vessels	s	s	s	Thoroughly described and the limited increase in boat traffic from this project will likely not have a particularly beneficial nor consequential effect.
Research (ecological/biological/oceanographic)	s	s	s	Well described and reflective.
Finances	i	i	i	There is no mention of how TOC in general or this project specifically is funded. The environmental impact of a project can be severely impacted by its funding source and this should therefore be mentioned. Lacking transparency

Benefit project specific

1. Local plastic clean up in hotspots.
2. Reduced breakdown of larger plastics to microplastics.
3. Reduced loss of marine life due to poisoning, choking, entanglement, etc.
    - Potential increase in fish stocks in the region.
        - Economic opportunity for fisheries.
4. Research value
    - Monitoring of biota, abiotic factors and collection of data from project and project sites
    - Analysis of bycatch.
    - Analysis of collected plastics.

Costs Project specific

1. Lack of transparency in the EIA as to how it is funded.
2. Transport of plastics from the pacific to Europe using containerships.
    - Increase chances of captured plastic re-entering the marine ecosystem due to accidents/shipwrecks.
    - Creating additional CO_2 footprint from shipping.
3. Entanglement in TOC equipment.

Appendix J - Review table Response to Criticisms

Criteria:

1. Has this criticism been incorporated into the EIA?
2. Are the answers to the criticism sufficient and well substantiated?

Score: insufficient (i) / point of attention (p) / sufficient (s)

Sufficient: Critics and comments well substantiated, minus possible small and unimportant points.
Point of attention: Critics and comments not well substantiated but probably no influence on conclusion.
Insufficient: Critics and comments not (well) substantiated with potential effect on conclusion/untrue.

Criticism	1	2	Comments
The Atlantic, De Correspondent 2019/2020. The neuston ecosystem is relatively unknown and is not mentioned in the environmental impact report.	s	p	The EIA acknowledges the limited knowledge about the neuston ecosystem and highlights the need for further studies to understand the neuston community better (4.3.2, 5.2.2). While the EIA mentions the neuston ecosystem, the depth of analysis and data remains limited, necessitating ongoing research efforts.
The Atlantic, De Correspondent 2019/2020. The Ocean Cleanup can significantly damage the neuston ecosystem.	s	p	The EIA identifies the potential risks to the neuston ecosystem and includes measures to monitor and mitigate impacts (4.3.2, 5.2.2). However, given the acknowledged gaps in knowledge, the extent of risk mitigation is still uncertain, indicating that this area requires ongoing attention.
The Atlantic, De Correspondent 2019/2020. There is little 'before' data available on the neuston ecosystem.	s	p	The EIA mentions the collection of baseline data through various sampling campaigns (4.3.1.7, 5.2.2, Appendix C). While initial steps have been taken, the historical lack of comprehensive baseline data limits the ability to fully assess impacts, suggesting a need for continued data collection and analysis.
The Atlantic, De Correspondent 2019/2020. Alternatives such as placing adapted designs near river mouths can cause less damage.	p	i	The EIA primarily focuses on the current deployment strategy in the open ocean, with limited discussion on alternative solutions such as river mouth deployments (5.2.1). This section highlights the difference between plastic entering the ocean from coastal populations versus rivers, but a stronger rationale is needed to conclude that the oceanic method is superior.
Demorgen.be, De Correspondent 2020. Lack of detailed information on the project's cost-benefit analysis.	-	-	See cost-benefit analysis.
Demorgen.be, De Correspondent 2020. Animals are not evenly distributed across the ocean, and specific species in target areas may be threatened.	s	s	The EIA discusses the uneven distribution of species in and outside the NPSG and includes measures to monitor and mitigate impacts on specific species in target areas (4.3.2.4, 5.2.2). This indicates adequate consideration of species (in particular neuston) distribution and targeted mitigation strategies.

Criticism	1	2	Comments
Demorgen.be, De Correspondent 2020. The floating arms of The Ocean Cleanup can harm marine life by trapping animals between the plastic.	s	s	The EIA includes detailed analysis and monitoring strategies to mitigate harm to marine life from entanglement or entrapment by the floating arms (5.2.2.2,). The measures taken appear to be well substantiated and effective in reducing harm.
Demorgen.be, De Correspondent 2020. There is insufficient knowledge about the long term effects of using the arms on the life in the upper layers of the ocean.	s	p	The EIA recognizes the knowledge gaps regarding long term effects and includes recommendations for continued monitoring and research (4.3.2, 5.2.1). The acknowledgment of these gaps is appropriate, but more data is needed to fully understand long term impacts.
De Correspondent 2019/2020.. The Ocean Cleanup can lead to an increase in jellyfish (neuston) blooms and the death of small marine organisms.	s	p	The EIA discusses potential ecological consequences, including the impact on marine organisms (5.2). However, specific predictions about the system actually causing potential neustonblooms is mostly based on expert judgement, indicating a need for more focused studies on this aspect.
De Correspondent 2020. Cleaning up a small percentage of plastic at high costs raises questions about efficiency and effectiveness.	s	p	The EIA includes discussions on the project's efficiency and effectiveness but could benefit from more detailed cost-effectiveness analyses (5.2.1).
De Correspondent 2020. The harmfulness of the floating plastic in the Great Pacific Garbage Patch is unknown.	-	-	See methodological check.
De Correspondent 2020. Little is known about the actual impact of GPGP plastics on marine life.	-	-	See scientific check.
De Correspondent 2020. Uncertainty about the ecological risks and consequences of the operation.	-	-	See ecosystem approach.
De Correspondent 2020. The Ocean Cleanup operates in a legal no-man's-land without clear regulations.	-	-	See legal check.
De Correspondent 2020. The focus is too much on symptom control instead of addressing the source of the problem.	s	p	The EIA primarily focuses on the cleanup efforts, with less emphasis on addressing the sources of plastic pollution (5.2.1).
De Correspondent 2019. The plastic collectors can act as FADs (Fish Aggregation Devices), attracting more marine life that ends up ingesting more plastic.	s	p	The EIA discusses the potential for plastic collectors to attract marine life and the associated risks (Appendix B, 3.1, 4.2.1). The leave in place option provides a higher NEBA score than option for removal of Ocean Plastics, indicating that the primer is more beneficial for nature. In the overall picture, however, the NEBA is more positive about the option of removing ocean plastic.

Criticism	1	2	Comments
The Atlantic. The use of barriers to collect plastic is compared to cutting down a forest in the name of forest management.	p	i	The EIA does not explicitly address comparisons with other EIA practices. This is not directly covered, indicating a need for broader contextual analysis.
demorgen.be. The arms catch many surface animals that are food for other marine animals.	-	-	See ecosystem approach.