

Response to Public Comments on 2019 draft NPDES permit for StarKist Samoa Tuna Cannery (AS0000019)

February 26, 2020

I. Background

EPA received comments on the draft permit, which was published for public notice and comment on July 3, 2019, with an initial closing date of August 2, 2019. StarKist Samoa Co., (hereinafter StarKist, discharger, or permittee) requested an extension of the comment period to August 16, 2019, which EPA granted. EPA received comments from the discharger as well as from the American Samoa EPA (AS-EPA). AS-EPA's comments were submitted with a cover letter from the American Samoa Governor. This response-to-comments document consolidates responses by topic. For the full content and context of the comments, readers should refer to the comment letters.

II. Responses to overarching or general comments

A. AS-EPA comments on ammonia and Ammonia Impact Ratio (AIR) limits

Response: EPA acknowledges AS-EPA's detailed technical discussion of the physical chemistry effects affecting implementation of ammonia limits, including the AIR protocol. Further, EPA appreciates AS-EPA's recognition of the use of a conservative approach to ensure protection of water quality when it would be technically challenging and logistically burdensome to require detailed analysis of chemical species in near-real-time to distinguish the bioactivity of ammonia (NH_3) and ammonium (NH_4^+). The AIR protocol is designed to minimize any potential uncertainty on the discharger's part about their compliance with water quality standards (WQS) and permit limits for ammonia that are dependent on other parameters, such as those in the American Samoa Water Quality Standards, 2013 Revision (ASWQS).

B. StarKist comments on the cost of treatment upgrades potentially required to meet the effluent limits of the draft permit.

Response: EPA based the limits in the draft permit on the CWA, implementing regulations, and ASWQS. The ASWQS state that in no event may water quality be degraded to an extent that it would interfere with or become injurious to existing uses. Similarly, federal anti-backsliding provisions prohibit a less stringent effluent limitation if such limit would result in the violation of any applicable WQS. Where EPA had discretion and the data supported our decision, EPA developed limits that StarKist can comply with without disrupting StarKist's operations in American Samoa.

Further, EPA notes that after the close of the public comment period, StarKist sent to EPA a technical memorandum, prepared on its behalf by Geosyntec and dated January 14, 2020 (January Memo), asserting that StarKist can meet the limits in the draft NPDES permit without additional Facility upgrades upon resumption of ocean

disposal. StarKist's assertion of permit compliance in its January Memo is based on the limits and terms of the public draft NPDES permit and the public draft Ocean Dumping Research Permit. StarKist's assertion that it can currently meet the draft NPDES permit limits in the January Memo further support the appropriateness of EPA's draft NPDES permit limits.

C. StarKist comments on newer monitoring data

Response: EPA acknowledges StarKist's continued submission of monitoring data. EPA's analyses focused on data collected from March 2018 to March 2019, which was consistent with the time period the discharger described as representative of performance achieved by the interim wastewater treatment upgrades completed under the Consent Decree StarKist entered into with co-plaintiffs the United States and American Samoa. Permit No. AS0000019 expired on March 31, 2013 and has been administratively extended. The CWA provides that NPDES permits be for five-year terms, CWA § 402(b)(1)(B); however, StarKist has been operating under Permit No. for approximately 11 years. In order to prevent further delay of permit issuance, EPA and StarKist agreed to treat February 2019 as a "pencils down" date for new data to be submitted. Due to delays in data submittal, EPA agreed to accept one additional data submission in March 2019. For these reasons, the permit analysis relies on data submitted from the discharger's stated "new configuration in service" date of March 2018 through March 2019. Importantly, the permit includes a specific reopener clause to incorporate required changes to treatment performance and if treatment processes change during the permit term (See permit section II.A.2 and II.A.3).

D. StarKist comments on "apportionment" of effluent limits between multiple users of the Joint Cannery Outfall (JCO) and application of the "anti-backsliding" requirements of CWA § 402(o). StarKist commented that EPA historically allowed StarKist and the former Samoa Tuna Processors, Inc. (STP) facilities to independently allocate between themselves their respective discharges at the JCO, and that EPA should continue to do so because it is consistent with past practice. StarKist additionally commented that the aggregate TN and TP limits in the combined loading previously authorized at the JCO do not trigger anti-backsliding and antidegradation concerns, and that very recent monitoring data shows compliance with ASWQS for these parameters. StarKist therefore requests that EPA relax limits from the 2008 permit for TN and TP further than EPA already has proposed in the draft permit, based on a dilution factor of 550:1 proposed by StarKist in their comments on the draft permit, derived from its UDKHDEN modeling. StarKist states that as long as the total loading to the JCO is not greater than that allowed by the 2008 combined permits (for STP and StarKist), no anti-backsliding concerns should apply. StarKist comments that CWA § 402(o)(2)(A) and 40 C.F.R. § 122.44(l)(1) both allow a less stringent permit limit if material and substantial alterations or additions to the permitted facility occurred after permit issuance and would justify application of less stringent effluent limits.

Response: EPA’s draft Permit already does in part what StarKist is requesting. EPA has allocated to StarKist a portion of the historical STP facility discharge at the JCO. STP stopped production in December 2016. StarKist is using portions of the STP facility (i.e. dock space and storage freezer) to support StarKist operations. STP has submitted a permit application for industrial wastewater discharges (i.e. condensate, washwater, and stormwater) from the facility to the JCO.

The draft Fact Sheet describes the basis for the TN and TP limits which are based primarily on EPA’s preferred and more appropriate model. See Fact Sheet section VI.C (page 19), and also Section IV of this Response to Comments. EPA is not revising the draft permit to include the TN and TP limits proposed by StarKist because they do not comply with ASWQS mixing zone provisions and consequently they do not comply with anti-backsliding provisions of the CWA.¹ As described in the draft Fact Sheet (See page 22-23), the anti-backsliding provisions are found at CWA § 402(o)(1), which generally prohibits the reissuance of an NPDES permit that contains either technology- or water quality-based effluent limits less stringent than the previous permit, with certain limited exceptions. The CWA does allow less stringent water quality-based effluent limits but only if the limits are in compliance with CWA § 303(d)(4) (antidegradation). However, CWA § 402(o)(3) of the CWA provides a floor below which such relaxation is prohibited: “In no event may a permit to discharge into waters be renewed, reissued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of the applicable water quality standard.” In this case, the TN and TP limits are based on state (American Samoa) standards. As discussed in the draft Fact Sheet, EPA did include less stringent TN and TP water quality-based effluent limits in the draft Permit. EPA evaluated whether those revised limits complied with CWA §303(d)(4).

StarKist erroneously cites to the anti-backsliding regulations at 40 C.F.R. § 122.44(l) in support of relaxing the TN and TP effluent limits. As described in the NPDES Permit Writers Manual: “if the permit condition being considered for relaxation is either a case-by-case effluent limitation [...] or is any other limitation, standard, or condition *other than an effluent limitation based on a state standard*, the permit writer can apply the requirements in § 122.44(l). For effluent limitations based on state standards, the permit writer should apply the provisions of CWA sections 402(o) and 303(d)(4) directly.” (emphasis added) Permit Writer’s Manual at 7.2.2.

Furthermore, EPA notes that StarKist bases their eligibility for backsliding of permit limits on their claim that ASWQS are “consistently met.” This assertion appears to be

¹ Additionally, when looking to see whether anti-backsliding is triggered, EPA looks to the previous permit. CWA § 402(o)(1). Therefore, StarKist’s request for EPA to evaluate backsliding by evaluating the aggregate discharge from the JCO based on the combined limits from both the StarKist and STP facilities is not the correct analysis under the CWA for antibacksliding.

based on analyses in various Receiving Water Monitoring reports which average data for individual parameters across the full vertical water column before comparing the data with ASWQS. Given that an effluent plume is normally expected to be concentrated at only certain depths rather than the entire height of the water column, EPA disagrees with this approach. ASWQS are intended to be protective of aquatic life. EPA believes determining compliance based on a water-column average could harm non-mobile species and notes the presence of Endangered Species Act-listed corals within close proximity to the JCO discharge. Many of those coral species have only a limited depth range for their habitat and are non-mobile, and would be specifically sensitive to pollutant concentrations at their respective depths. Thus, averaging across all depths would not ensure protection of these species. EPA also notes that this is one reason why the draft Permit includes a reef monitoring program. As explained on pages 20-21 of the Fact Sheet, EPA's application of the ASWQS is protective of the aquatic life designated use by ensuring that chronic effects of the discharge do not impact non-mobile species such as corals.

- E. StarKist submission of updated process flow diagram
Response: EPA acknowledges StarKist's submission of an updated Facility diagram and has incorporated this revised diagram into the permit. EPA notes that this process flow diagram is representative of current treatment processes, which may be subject to further change. Further, in accordance with 40 CFR § 122.41(l), the draft permit requires EPA be notified as soon as possible of any planned physical alterations or changes to the permitted facility.
- F. StarKist comment on permit language regarding intent of the Consent Decree: StarKist requested that EPA revise the following statement in the draft Fact Sheet, which StarKist reads to imply that currently it is out of compliance with water quality standards: "The permittee is currently conducting treatment and operational changes under a judicial consent decree to achieve current and future compliance with permit limits, including attainment of applicable water quality standards."
Response: EPA is retaining the Fact Sheet statement because it is an accurate general statement of the intent of the Consent Decree, which requires current and *future* compliance with permit limits and water quality standards.
- G. StarKist comments on receiving water data for compliance determination. StarKist commented that based on receiving water data collected at the edge of the mixing zone, the ASWQS are currently being met (see EPA's concerns with this comment in the final paragraph of response II.D above). On that basis, StarKist also commented that TP and TN should only be monitored at the zone of mixing stations. Thirdly, StarKist commented that monitoring at zone of initial dilution stations and end of pipe station 14 should be eliminated entirely, based on the presumption that only zone of mixing data should be used for compliance determination.

Response: As discussed below, EPA has discretion in how it establishes and measures effluent limits in permits. Further, EPA’s approach is consistent with past practice as the existing (administratively continued) permit also establishes effluent limits that apply at “end of pipe,” measured immediately before StarKist effluent is released into the Joint Cannery Outfall and commingled with effluent from the adjacent STP cannery.

Compliance with permit effluent limitations for this Facility is determined based on this end-of-pipe data. CWA sections 308(a) and 402(a), and 40 CFR sections 122.41(h), (j), (l), 122.44(i), and 122.48 authorize the inclusion of monitoring and reporting requirements in NPDES permits. Furthermore, 40 CFR §122.44(d)(1)(iii) specifies that “When the permitting authority determines, using the procedures in paragraph (d)(1)(ii) of this section, that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant.”

As defined at 40 CFR §122.2, an “effluent limitation” is a “restriction imposed by the Director on quantities, discharge rates, and concentrations of “pollutants” which are “discharged” from “point sources” into “waters of the United States...”, as each of those terms are defined in the same section, meaning that data must be collected on these quantities, discharge rates, and concentrations at the time of discharge for compliance determination. Further, per 40 CFR §122.44 requires that “each NPDES permit shall include conditions...”, at subparagraph (i)(1), “To assure compliance with permit limitations, requirements to monitor - The mass for each pollutant limited in the permit; The volume of effluent discharged from each outfall; [and] Other measurements as appropriate...”. Effluent monitoring is required to determine compliance with NPDES permit conditions and water quality standards; assess and improve plant performance and identify operational problems; provide information on wastewater characteristics and flows for use in interpreting water quality and biological data; and to conduct reasonable potential analyses for toxic pollutants. EPA is retaining the ZID monitoring locations to verify that there is no lethality to organisms passing through the mixing zone, protect critical resource areas, and ensure that the discharge is not posing a health risk, considering likely pathways of exposure to the discharge plume.

Furthermore, EPA does not make compliance determinations through language in NPDES permits themselves. The draft permit does not authorize activities inconsistent with the CWA, and NPDES regulations do not require that a discharger be in compliance with a permit before the permit is reissued. 40 CFR §122.44(d). Note that EPA has ensured the final permit continues the outfall maintenance and monitoring requirements established under the previous permit, as well as other

monitoring in the receiving water to validate plume behavior and detect any unidentified adverse effects of the discharge.

For EPA's responses to the discharger's comments about diffuser and zone of mixing monitoring stations, see section VI of this document.

H. StarKist comments on AS-EPA submissions to EPA

1. StarKist comments on EPA's evaluation of mixing and consideration of AS-EPA input

Response: EPA finds no factual basis to StarKist's comment that EPA has not presented "very good cause" for selecting EPA's mixing zone modeling over the modeling preferred by StarKist and accepted by AS-EPA. Please see Section IV of this document for a comprehensive discussion of why EPA selected the CORMIX model, including its underlying assumptions and conclusions, and why it did not rely on the UDKHDEN model and conclusions submitted by StarKist. As StarKist notes, EPA is the NPDES permitting authority for the Territory of American Samoa, and as such, EPA makes the final permitting decisions. While the Agency has considered AS-EPA's support for StarKist's preferred model, EPA has explained why the CORMIX model capabilities are appropriate for this permit. As noted in EPA's draft Fact Sheet at page 12, *"it is the policy of the [Environmental Quality Commission] that zones of mixing shall be limited to the smallest area possible."* Further, the draft Fact Sheet notes that the ASWQS explicitly acknowledge that the "granting of a mixing zone shall be subject to approval by USEPA." See ASWQS Section 24.0207(c)(6).

EPA disagrees with StarKist's assertion that EPA failed to give consideration to the AS government's collective comments supporting the mixing zone modeling and resulting limits proposed by StarKist. On August 13, 2019, the AS Governor submitted comments on the draft permit expressly thanking EPA *"for demonstrating great sensitivity to the potential devastating impact StarKist would have on the economic, social and political survival of American Samoa"* and noting that the draft permit *"reflects the accommodating perspective exhibited by US-EPA without compromising or undermining the intent of the law relative to ensuring that the environment's integrity is not jeopardized."* *I am thankful to see US-EPA's attempt to strike a balance between economic and social welfare of the people and protecting the environmental standards."*

Similarly, the Director of AS-EPA, in his letter of August 12, 2019 commenting on the draft permit, noted that *"US EPA has been very cooperative and collaborative in re-evaluating several extremely important Permit conditions and requirements, and AS-EPA fully supports continued dialogue between StarKist and USEPA."* AS-EPA then highlights a number of "important requests by StarKist"

that EPA already has granted, including increases in total nitrogen and total phosphorus limits, and elimination of most of the metals limits, among others. Similarly, the AS Governor notes that “*we are grateful that US-EPA, AS-EPA, and StarKist are engaged in exhaustive discussion of issues before respective rulings are declared.*” These comments from the AS Government certainly do not support StarKist’s allegation that EPA has “ignored” and “disregarded” comments from the AS Government and such was “arbitrary, capricious, unreasonable and contrary to law.”

Similarly, EPA finds no factual basis to StarKist’s comment that EPA ignored and disregarded the CWA §401 certification response from American Samoa, without any explanation. In its CWA §401 certification response, AS-EPA found that the draft permit is consistent with the ASWQS and provided no substantive comments. AS-EPA stated that the certification is given provided the ASWQS continue to be met. Because provision I.A.3 of the draft permit requires “The discharge shall comply with all provisions of the American Samoa Water Quality Standards,” no response from EPA is warranted. EPA also notes that StarKist submitted its comments on the draft permit on August 15, 2019. EPA did not receive the AS-EPA CWA §401 certification letter until two weeks later on August 29, 2019. It therefore appears that StarKist’s comment regarding CWA §401 certification was premature.

2. StarKist comments on details of AS-EPA modeling review

Response: EPA disagrees with StarKist’s comment that EPA has not presented “very good cause” for selecting EPA’s mixing zone modeling over the modeling preferred by StarKist. In the draft Fact Sheet, EPA included a comprehensive modeling discussion, including model selection, approach, and conclusion. *See* Fact Sheet, Section VI.2.B.

As noted in EPA’s draft Fact Sheet at page 12, the ASWQS provide at Section 24.027 that “*it is the policy of the [Environmental Quality Commission] that zones of mixing shall be limited to the smallest area possible.*”. Further, the Fact Sheet notes that the ASWQS explicitly acknowledge that the “granting of a mixing zone shall be subject to approval by USEPA.” *See* ASWQS Section 24.0207(c)(6).

EPA carefully considered the AS Government’s collective comments, including comments related to StarKist’s modeling, and included responses to those comments in this document. EPA did not agree with all of the AS Government’s recommendations. EPA also notes that EPA conducted a detailed technical review of StarKist’s successive mixing proposals, due in part to these comments. EPA revised its modeling efforts, which yielded a slightly higher dilution factor of 343:1 as opposed to 330:1.

In evaluating these dilution factors, EPA also considered StarKist's January Memo, submitted after the close of the public comment period. The January Memo asserts that StarKist can meet the draft permit limits without implementing additional Facility upgrades, once ocean disposal resumes consistent with the terms of the public draft Ocean Dumping Research Permit. EPA has considered this new information in the context of the ASWQS provision on mixing zones which states a policy "that zones of mixing shall be limited to the smallest area possible" (§24.0207(a)). StarKist's assertion in the January Memo that it can meet the draft permit limits, which are based on a 330:1 dilution factor for specific parameters and smaller dilution factors for the remaining parameters, further supports the validity of EPA's draft permit. StarKist's proposed less stringent limits for certain parameters, based on higher dilution factors and a resulting larger mixing zone area, would run afoul of the above provision of the ASWQS. As a result, EPA chose to retain the dilution of 330:1 in the final permit because this dilution is protective of ASWQS as a reasonable worst-case scenario.

3. StarKist comments on AS-EPA and AS Government evaluations of water quality. StarKist asserts that letters from AS-EPA and AS Governor "recognize that ASWQS are being met" and that EPA is "obligated to give consideration" to the territory's conclusion(s).

Response: As discussed in response II.H.1 above, EPA has given due consideration to the comments submitted by the AS Government, including their collective comments that currently WQS are being met. In fact, the draft Fact Sheet already acknowledged that the more recent monitoring data collected in 2018-2019 showed improvements for certain parameters in Pago Pago Harbor. *See* draft Fact Sheet page 4, 15, and 22.

- I. StarKist assertion that the draft Fact Sheet contains unsupported statements regarding currents in Pago Pago Harbor. StarKist's further discussion assumes EPA claims the underlying harbor hydrography has changed.

Response: EPA disagrees that the Fact Sheet contains unsupported statements regarding its modeling approach and believes that StarKist has misread EPA's statement in the draft Fact Sheet. EPA explains that it is the low precision of the instruments used to collect the current data in the mid-1980s, plus the limitations of the dye studies used in 1993 (only 2 studies, few depths analyzed, flow direction varying between the depths analyzed when StarKist's modeling assumes a uniform flow out of the Harbor at all depths, etc.) that may render the available current data insufficient. *See* Draft Fact Sheet section 2.A. Current interactions can have a dramatic effect on effluent mixing, especially in the far field region which StarKist's preferred dilution analysis relies upon. Similar to density (i.e., stratification), current speed can vary across depths and can also be confounded by time-varying tidal effects commonly associated with bays and enclosed harbors. Under critical conditions of low wind and

current such as those shown to occur in the receiving water, diluted effluents may linger in the vicinity of the effluent plume or become re-entrained in the plume flow, significantly reducing effective dilution. For this reason, EPA believes that the limited current information available as a model input is a further basis for the 330:1 dilution used to calculate effluent limits as a reasonable worst-case scenario in the final permit.

III. Responses to comments on Nutrient Limits

A. AS-EPA comments on Total Nitrogen (TN) and Total Phosphorous (TP) limits

Response: EPA appreciates AS-EPA's recognition that TN and TP limits have increased in the draft permit. EPA's analysis of the protectiveness of these changes to the nutrient limits is discussed in the draft Fact Sheet (pages 18 and 21-24) and further supported by details of the additional modeling discussed in section IV of this response to comments document.

B. StarKist comments on definition of mixing zones

Response: EPA acknowledges StarKist's request for an express EPA approval of any mixing zones authorized in the draft permit as well as a statement defining the size and scope of the mixing zone for each pollutant. In the draft Fact Sheet, Section II highlights the changes between the administratively continued and draft permits. In the 5th line of the table, on page 2, EPA expressly states that it has granted an increase in the mixing zone (dilution factor) for TN and TP limits, based on improved computer modeling. "EPA has chosen to grant an increase based on reasonably protective mixing analysis and the reduced burden on the existing assimilative capacity in the receiving water due to the cessation of major discharges from the adjacent Samoa Tuna Processors cannery using the same outfall." Draft Fact Sheet page 2. On page 12-14 of the draft Fact Sheet, EPA compares StarKist's requested mixing zone (dilution ratio) for each impacted pollutant with the dilution allowance provided in the current permit (2008) and draft permit.

EPA summarizes the mixing zone analysis as follows on page 14 of the draft Fact Sheet:

The permittee's MZA sought a mixing zone 981 feet in radius, with a claimed dilution of 1008:1 within that area. EPA's preceding permit allocated only a 248:1 mixing ratio within a mixing zone of approximately double that area (1300 feet in radius). Revised modeling conducted by EPA using the CORMIX software package to ensure compliance with ASWQS found that the maximum mixing to take place before the effluent plume interacted with a defined mixing zone boundary (e.g., water surface, reef slope/reef flat, cessation of effective mixing) was 330:1 and has implemented that mixing increase in the permit limits for the affected parameter(s). EPA has set receiving water monitoring requirements at the old (1300-foot) and permittee-proposed (981-foot) mixing zone radii, as well as sensitive locations like nearby coral reef boundaries, to evaluate modeled mixing performance with real-world data.

While EPA believes the draft Fact Sheet already provides express approval and definition of mixing zones for certain pollutants, to provide further clarity, and consistent with the ASWQS requirement that EPA must approve the granting of any mixing zone, *see* ASWQS Section 24.0207(c)(6), EPA included an explicit statement on dilution factors in part I.B of the final permit.

- C. StarKist inquiry into translation of ASWQS for nutrients into permit limits, clarifying the basis for setting the daily maximum nutrient limits. StarKist inquires about the distinction in the application of the daily maximum limits in the draft permit and those set in the Utulei Sewage Treatment Plant NPDES permit (AS0020001), which discharges into a different portion of the same waterbody. StarKist claims both permits should be subject to the same %-of-time-not-to-exceed standard provided in the ASWQS.

Response: The ASWQS specify several statistical (%-of-time-not-to-exceed) nutrient standards. In the draft permit, EPA established the daily maximum nutrient limits on the “not to exceed more than 10% of the time” ASWQS for TN and TP. Translating this standard into the daily maximum effluent limit ensures that the permit limit will be protective of the water quality standards and designated uses of the receiving water.

Based on the effluent nutrient levels from StarKist’s March 2018-March 2019 data, EPA determined that there was reasonable potential to exceed the no more than 10% of the time standard. TN ranged from 198 to 4,575 lbs/day, with a coefficient of variation (CV) of 0.38, and TP ranged from 5 to 520 lbs/day, with a CV of 0.63. This data range suggests a notable degree of variability in the effluent, and together with the demonstrated reasonable potential to exceed ASWQS (see the Reasonable Potential analysis in the draft Fact Sheet), a more stringent effluent limit is necessary to ensure that the not-to-exceed-more-than-10%-of-the-time standard is met. EPA is requiring twice-weekly monitoring for nutrients in the StarKist discharge because a variable discharge requires more frequent monitoring to determine its potential effects than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentrations).

EPA has also taken the opportunity to re-analyze the effluent limits set for the Utulei Sewage Treatment Plant permit and will carefully assess whether an effluent limitation based on the “not to exceed more than 10% of the time” standards is protective of ASWQS.

- D. StarKist proposed alternate dilution factor

Response: EPA takes note of StarKist’s latest dilution model, submitted during EPA’s public comment period on the draft permit. EPA has reviewed the modeling and dilution factors proposed in StarKist’s multiple successive revisions to the permit application, before and after release of the draft permit, and remains concerned that

several of the simplifying assumptions made in the discharger's model are not representative of the expected plume behavior in Pago Pago Harbor. EPA national experts also have taken the discharger's most recent modeling submission and used the same inputs to refine EPA's modeling in an attempt to ensure a dilution factor protective of water quality is determined as accurately as practicable given the limitations of the available sampling data for Pago Pago Harbor (minimal data on current speeds and directions across depths, receiving water data collected only twice per year, etc.). See section IV of this response to comments for additional details on the results of EPA's model revisions in response to the discharger's latest round of submissions.

IV. Responses to comments on Dilution Modeling

A. AS-EPA comments on approach to coordinating modeling

Response: EPA acknowledges AS-EPA's expressed support for a coordinated monitoring and modeling effort. A coordinated effort will better characterize the effluent discharge and the available dilution in Pago Pago Harbor. EPA has described its best estimate of protective discharge levels, and the procedures for determining those values, in the permit record. Moving forward, the revised monitoring requirements in the permit are explicitly designed to collect the data necessary for a more thorough assessment of conditions in the Harbor, with a particular focus on sensitive points (e.g., coral reefs within the mixing zone and sites the plume may cross which are not due south out of the Harbor).

B. Appropriateness of the CORMIX computer model

Response: EPA contacted Dr. Robert Doneker, original developer of the CORMIX model and current technical lead of the company that maintains and updates it (MIXZON, Inc.). Dr. Doneker affirms that CORMIX has a long history of use in modeling ocean discharges for both regulatory and scientific purposes, inside and outside the United States, dating back to at least 1995. Therefore, EPA disagrees with StarKist's comment that the model is unsuited for such purposes. For examples of applying CORMIX to ocean discharges, see section 12 of the bibliography attached to Dr. Doneker's memo.

C. StarKist comments on use of vertical density profile data (i.e., stratification)

Response: EPA initially made the conservative modeling assumption that density conditions in Pago Pago Harbor would not always be stratified. EPA made this assumption based on daily and inter-annual variability and the limited density profile data. In the Technical Support Document for Water Quality -based Toxics Control, also known as the TSD (EPA/505/2/90-001), EPA explains how dilution, explicitly stratification, can be analyzed. Per Section 4.4.1 of the TSD, both minimum and maximum stratification periods are usually modeled to determine critical conditions since vertical mixing can be limited by stratification and determines whether the plume

becomes trapped subsurface or rises to the surface. However, based on Starkist's comments about EPA's model approach, EPA re-modeled the discharge using the most conservative density profiles in addition to the two density profiles used in the EPA's previous dilution analysis. Based on these input values, the results demonstrate that using observed density stratification conditions, the edge of the plume (half-width) would still be likely to surface, and in any case, limit approvable dilution to a value no greater than 343:1. The small (less than 4%) deviation of this result from EPA's previously determined 330:1 dilution factor further validates EPA's previous dilution analysis.

In addition, StarKist asserts in their January Memo that the Facility is capable of complying with the limits in the draft permit, which EPA based on 330:1 dilution, upon the resumption of ocean disposal operations. (See January Memo, page 2). Pursuant to the ASWQS, which specify that "it is the policy of the EQC that zones of mixing shall be limited to the smallest area possible" (§24.0207(a)), EPA is limiting the dilution to 330:1 as opposed to 343:1. EPA finds that its previous dilution analysis is a reasonable worst case scenario and based on StarKist's own assertions, a dilution factor greater than 330:1 is not warranted. In the final permit, the TN and TP limitations are based on this dilution and unchanged from the draft permit.

- D. StarKist interpretation of ASWQS. StarKist claims that EPA's use of the CORMIX modeling was inappropriate for a number of reasons, including StarKist's claim that "a plume that occasionally surfaces is not prohibited by ASWQS. Instead the relevant question is whether the ASWQS are exceeded at the surface." StarKist adds that EPA ignores this distinction. StarKist further claims that the depth selected by EPA for dilution determination is arbitrary

Response: EPA believes that a plain reading of the ASWQS Zone of Mixing Criteria, found at Section 24.0207(b), undermines StarKist's interpretation. Section 24.0207(b) provides that:

(9) A zone of mixing *shall not be granted if it would include the surface of the water body*, any part of the shoreline, *or any part of any barrier or fringing reef*; and

(10) Further, the following shall be considered by the EQC in determining whether to grant or deny a zone of mixing:

(A) Protected uses of the body of water;

ASWQS Section 24.0205(e)(1)(A) lists the protected uses of Pago Pago Harbor as including, among others, "[w]hole and limited body-contact recreation, e.g., swimming, snorkeling and scuba diving."

StarKist provides no references in support of its declaration that "an occasional surfacing of the plume does not violate the clear regulatory prohibition that a mixing zone "shall not be granted if it would include the surface of the water . . . or any part of any barrier or fringing reef." StarKist's argument is further flawed by claiming that its

proposed mixing zone (dilution of 1008:1) would only “occasionally” surface, contradicting earlier assertions that the plume does not surface.

For the reasons already outlined in the draft Fact Sheet (see pages 11-14) and in this response to comments document (see other responses in this section IV supporting EPA model), EPA has demonstrated that the CORMIX model is an appropriate one to use for this permit to protect designated uses. Accordingly, EPA has selected a dilution, based on its modeling, which prevents the mixing zone from incorporating the water surface or the nearest fringing reef (approximately 500 feet northeast of the diffuser location) and thus is consistent with ASWQS.

E. StarKist discussion of 1985 EPA model guidance

Response: StarKist states that 1985 EPA guidance provides that: “for those parameters with median water quality criteria it is more appropriate to determine a median dilution to define the mixing zone.” However, the language in the referenced EPA guidance is narrower. The relevant passage from EPA/600/3-85/073a (November 1985), page 9, is “Application of multiple “worst case” factors (i.e., flows, stratification, and currents) to determine a minimum dilution must be done carefully, however, and in recognition of the criteria for which compliance is being determined. For example, although application of an absolute “worst case” dilution may be appropriate for determining compliance with an acute toxicity limit, it is more appropriate to identify the lowest 6-month median dilution **to determine compliance with a 6-month median receiving water limitation**” (emphasis added). EPA is not establishing receiving water limitations with this permit, let alone median limitations averaged over 6 months. EPA’s permit sets end-of-pipe effluent limitations, for both daily and monthly averaging periods. EPA believes the approved dilution factors are a reasonable representation of reliably attainable dilution in Pago Pago Harbor given the limitations of input data, such as the current speed and direction as discussed in response II.I above.

F. Far-field dilution

Response: Based on EPA’s repeated modeling of the discharge plume in response to StarKist’s requests to consider less conservative inputs, EPA still finds that there is potential for the plume (specifically, plume half-width) to reach the surface. Consistent with AWQS, EPA is only considering available dilution before plume surfacing (see response IV.D above). In other words, due to potential plume surfacing, the dilution allowable is limited to that which occurs without (i.e., before) the plume surfacing. As a result, far-field dilution (which StarKist’s analysis had based on a simple linear model not accounting for the effects of the harbor boundary, etc.) is not appropriate. Additionally, as StarKist bases some of its assertions regarding far-field dilution effects on the behavior of dissolved oxygen in the receiving water (SKS comment VI.B.7), EPA has clarified that compliance with the ASWQS narrative standard for dissolved

oxygen remains a condition of the permit.

G. StarKist noting additional diffuser port

Response: As stated in the CORMIX user manual, mixing in multiport diffusers after plume merging is primarily controlled by the flux of momentum and buoyancy per unit of diffuser length in relation to the local layer depth. Thus, the CORMIX model uses the primary controlling variable of flux per length of the diffuser, not the number of ports to determine mixing behavior. Changing the number of ports will not affect CORMIX flow classification or dilution estimates of near-field mixing after plume merging occurs. EPA notes that follow-up modeling in CORMIX demonstrates that plume merging appears to occur before a dilution of 150:1 is achieved, well before buoyant mixing reaches even 200:1 dilution. Therefore, the diffuser configuration is not expected to have a controlling effect on the ultimate (far-field) dilution.

H. Consideration of background and boundary-interaction effects

Response: EPA remains concerned that the UDKHDEN model, which assumes an infinite ocean, does not appropriately limit its conclusions when real-world constraints like bathymetry (the nearby reef slopes, etc.) may affect, be affected by, or interact with the discharge. This topic is particularly sensitive because the reef slopes are within StarKist's proposed mixing zone. The reef slopes are likely to be home to several endangered coral species, which would not be able to re-locate in the event the discharge was to affect them. As a result, EPA prepared both near-field and far-field analyses of dilution in Pago Pago Harbor using CORMIX's built-in capability to warn when boundary interactions may affect achievable dilution. The results of this CORMIX output suggest that bank interaction does begin to cause a limiting effect on dilution even in the near-field (NFR) phase.

I. Consideration of plume surfacing

Response: As described above in response IV.C, EPA has re-modeled the discharge plume in consideration of StarKist's assertion that the Harbor water is always density-stratified. Even making this assumption, with a critical density profile proven by measurement to occur in the receiving water, the plume centerline can rise to a depth of less than 30 feet below the surface (45.45 m plume rise with 0.07 kg/m^3 density gradient, see model output). However, as supported by the modeling, a wastewater plume, with these characteristics, spreads from its centerline in the vertical as well as horizontal directions. Based on EPA's modeling, a significant portion of the plume (known as the "half-width") can rise to, or very near to, the surface within the horizontal boundary of the proposed mixing zone. As ASWQS do not permit inclusion of the water surface in a mixing zone, EPA has granted use of only that mixing which occurs before the plume half-width reaches the surface. In the case of EPA's remodeling, this pre-surfacing dilution is 343:1. In EPA's earlier modeling, the pre-surfacing dilution was 330:1. With this re-modeling, EPA believes that the 330:1 is a

reasonable worst-case scenario of available dilution. Based on the constraint of the ASWQS mixing zone policy that mixing zones shall be limited to the smallest area possible (ASWQS §24.0207(a)), and StarKist's assertion in the January Memo that they are capable of meeting the limits based on the dilution which would be associated with a smaller area (330:1), EPA has opted to retain the 330:1 dilution. EPA finds that the approved dilution is protective of ASWQS.

- J. StarKist assertion that observations of floating material in the Harbor are unrelated to the discharge

Response: EPA takes note of StarKist's comments (SKS comment VI.B.6) that observations of floating material at the harbor surface are due exclusively to the actions of other harbor users (e.g. discharge from commercial fishing vessels). However, due to the proximity of the observations to the location of the diffuser and the statements on the nature of the observed floating material made by local citizens to AS-EPA, EPA remains concerned over the potential for the plume to encroach upon the surface and/or affect the designated uses of Pago Pago Harbor beyond the mixing zone. Furthermore, as StarKist notes, there have been periods where the outfall was "not operating correctly" due to pipe breaks, etc, which did release floating materials. Therefore, EPA has updated the permit language to clarify that outfall inspection and maintenance requirements prohibiting such releases, equivalent to those in the previous NPDES permit, remain in place.

- K. Consideration of depth-varying current effects and models' respective capabilities to reflect them

Response: EPA has reviewed StarKist's revised dilution model submitted as part of its public comments and has concerns about the model approach and inputs associated with current direction. The most recent round of UDKHDEN modeling still does not account for current directions changing with depth as the effluent plume rises through the water column. As stated in previous discussions with the discharger, an updated current profile that accurately accounts for current direction is needed. EPA does not agree with the assumption of a uniform current direction that flows south out of the Harbor because the Harbor is a wind-driven current system (see discharger's comments on minimal or absent tidal currents in the system). The depth-invariant current assumption is a limitation of the capabilities of the UDKHDEN model. As expressed in the receiving water monitoring requirements in the permit and this response to comments document, this is an important element of background data to collect for the next permit cycle. EPA's chosen dilution represents a reasonable worst-case scenario.

V. Responses to comments on Specificity of Mixing Zone Language

- A. StarKist's comments on specificity of the mixing zone language in the draft permit.

Response: EPA understands StarKist's request for clarity. The dilution factors being granted for various pollutants are summarized in Table 3 of the Fact Sheet. Note that it

is a specific dilution factor, *not* an area, which is the basis for limits in this permit. As demonstrated through multiple discussions with StarKist about the intent of the language in the administratively continued permit, defining dilution allowances in terms of an area has resulted in confusion regarding effluent limits and receiving water monitoring program requirements (see also response II.G).

VI. Responses to comments on Receiving Water Monitoring

A. AS-EPA comments on Turbidity monitoring in receiving water

Response: EPA has not eliminated the turbidity monitoring requirement, as this remains a standard in the ASWQS. Turbidity data must be collected to verify protection of corals and other species in the receiving water. Field turbidity probes with sufficient accuracy to evaluate attainment of the ASWQS are available on the open market. See also response VI.L, below.

B. AS-EPA comments on metals monitoring in receiving water and effluent

Response: EPA appreciates AS-EPA's acknowledgement of the collaborative effort to identify which of the metals parameters in the previous permit warranted continued attention in future monitoring.

C. AS-EPA comments on end-of-pipe station (station 14)

Response: EPA's purpose for retaining the diffuser monitoring station in the receiving water is to verify the behavior of the effluent plume. Given the Agency's experience with other discharges into enclosed bays and harbors, there is a non-trivial possibility for the effluent plume to cross back over the diffuser site. This is particularly sensitive because of the limited detail of the available information about currents in Pago Pago Harbor and how they vary across depths and seasons. The data available at present are not sufficient for EPA to rule out the possibility of re-entrainment, where effluent re-crosses the diffuser location. This re-entrainment significantly reduces effective dilution because the "diluting" water already contains effluent. Therefore, data collection at the diffuser site remains necessary until the plume behavior can be adequately characterized.

D. AS-EPA comments on reference station R

Response: EPA appreciates AS-EPA's input using its local knowledge to suggest a workable alternative to the existing reference station. The discharger has expressed reservations about the existing reference station due to possible proximity to an old navy dumping site. Previous proposals for alternative reference stations were outside of the Harbor and therefore, not representative of the water quality at issue. EPA has incorporated AS-EPA's suggested reference station site into the permit's receiving water monitoring plan by including that a new reference site should be located "midway along the line drawn from Niuloa Point to Breaker's Point." See final permit

section I.E.1.a (Reference site Ref).

E. AS-EPA comments on proposed coral reef monitoring stations

Response: EPA appreciates AS-EPA's detailed input on the importance and viability of coral reef monitoring stations, as well as the use of AS-EPA's local expertise to propose reasonable compromises for sampling accessibility, and oceanic-condition-driven variations in the sampling sites. EPA has incorporated AS-EPA's proposed coral reef monitoring locations into the permit's receiving water monitoring plan by stating that stations shall be as near to the breaking waves of the reef crest as is reasonably achievable, where a water sample (and any required in-situ data collection) can be obtained in proximity to the fore reef at a nominal depth of no greater than 30 feet, with due consideration given to vessel safety as determined by the vessel operator. See final permit section I.E.1.g.

F. AS-EPA comments on revising Far Field station location

Response: EPA appreciates AS-EPA's support for the proposed far field station location in EPA's draft permit. Based on this input, EPA is retaining the existing far-field monitoring location for the sake of data continuity and because it meets the criteria suggested by AS-EPA.

G. StarKist comments on coordination of monitoring programs across multiple facilities

Response: EPA acknowledges StarKist's concerns about monitoring logistics if permit reissuance schedules were to simultaneously require different monitoring locations and protocols for permits in different stages of revision. EPA has made a concerted effort to ensure the maximum possible consistency from old to new monitoring plans and to synchronize permit reissuances as much as possible. EPA anticipates that at most one semi-annual sampling may be affected by an overlap of old and new receiving water monitoring plan requirements.

H. StarKist requests to remove monitoring stations

Response: EPA does not agree with StarKist's framing of receiving water monitoring as an effort only relevant to compliance determination. See response II.G. for permit compliance and specific regulatory authorities. Receiving water data is collected to verify performance of the permit limits in attainment of ASWQS, including validation of plume behavior, dilution modeling, and species protection such as coral reef interactions. For this reason, it is necessary to collect samples at several locations which the plume may cross in its travel. These locations including sites within the outer boundary of the Zone of Mixing, sites of particular sensitivity (e.g., reef sites), and a reference site within the Harbor. As explained in response VI.D, receiving water monitoring also includes a diffuser monitoring station. EPA will retain the receiving water monitoring program in order to collect data in support of these goals. However, in order to limit monitoring effort where possible, EPA has modified the permit to

require monitoring at the old (1300-foot) Zone of Mixing stations for only the first two years of the permit, to provide an overlapping data set supporting comparison with the new stations at the 981-foot radius.

I. StarKist proposed changes to zone of initial dilution (ZID) stations

Response: EPA does not perceive added value in moving ZID stations “to deeper water” as StarKist proposes. Because effluent plumes such as the one from the JCO are expected to rise through the water column, depths below the diffuser are unlikely to offer additional insights unless some component of the discharge were expected to be non-buoyant and sink or settle out of the plume after initial jet rise. The value in the ZID stations, especially for validating plume behavior as discussed in response VI.H above, is the continuous data set at locations between the diffuser and the edge of the zone of mixing (ZOM). This data set can be used to determine plume depth and direction at those intermediate distances. Therefore, additional lateral displacement of the ZID stations would not add value to the data collected, and displacement to ‘deeper’ water would not meaningfully help characterize a rising plume.

J. StarKist request for alternative sampling depths at “Other monitoring stations” (8N, 8W, 8S, 16N)

Response: EPA acknowledges StarKist’s comments about potential sampling depth variation associated with certain stations due to irregular seabed depth and tidal height. The requirements for consistency of sampling depth at each receiving water monitoring location, as expressed in EPA’s draft permit, are intended to ensure that data collected at a given sampling location are comparable over time, and comparable between different parameters. Adjustment of station location (coordinates) as proposed by StarKist would not support the necessary data consistency.

Minor tidal variations in water column depth at the set monitoring locations should not be taken to imply variable sampling depths. A mean (average) bottom depth should be used when determining the depths of sampling points and these should be maintained as consistently as possible over multiple sampling events, similar to existing practice for the discharger’s previous receiving water monitoring reports.

K. StarKist request to reduce receiving water monitoring frequency at ZID and Reef stations to twice per permit term

Response: EPA recognizes StarKist’s desire to avoid unnecessary monitoring costs. However, this permit is being issued to a Facility that, since last permit issuance, has significantly changed its operations, treatment processes, discharge practices, and other factors likely to affect the constituents of its effluent and potentially its behavior in the receiving water. Furthermore, the ZID and especially Reef stations are incorporated into the receiving water monitoring plan to address a significant need to verify effluent

plume behavior and consistent protectiveness of endangered species habitat known to occur in close lateral proximity to the discharge – well inside the existing mixing zone boundary. Therefore, for this permit term, it is important to collect a meaningful, multiple-data-points-per-year data set to establish a baseline and allow for detailed analysis of the revised discharge. If these data indicate a lack of cause for concern at the ZID and Reef sites, EPA may reduce monitoring requirements as appropriate through a modification or reissuance of the permit.

L. Availability of field instruments for turbidity monitoring

Response: After consultation with instrument experts at the EPA Region 9 Laboratory, EPA has verified that field turbidity sondes with sufficient accuracy to evaluate turbidity are readily available and should not pose a logistical problem for receiving water monitoring. The most sensitive turbidity standard for Pago Pago Harbor is 0.75 NTU (median not-to-exceed). Several turbidity probes on the market have detection resolutions of less than half that level (0.3 NTU or FTU equivalent). While EPA does not and cannot recommend any specific instrument product, this capability can be found, for example, in instruments from such manufacturers as YSI, EXO, and Campbell Scientific.

M. StarKist comments on reef monitoring stations

Response: EPA has made changes to the reef monitoring stations. In absence of a discharger proposed alternative location, EPA has incorporated AS-EPA's suggestions on defining reef monitoring sites See response VI.E. and final permit section I.E.1.g.

N. StarKist Request to monitor and report Ammonia in receiving water in mass of N, not NH₃

Response: EPA recognizes StarKist's request that receiving water data for ammonia be collected on the basis of ammonia-as-N rather than ammonia-as-NH₃ (which is simply a mathematical conversion by a factor of 0.822 based on molecular masses). EPA has incorporated the requested change into the permit language.

O. StarKist request for language allowing for weather-related monitoring disruptions: StarKist requests that EPA add language stating that "If an event arises from causes beyond StarKist's control, such as unfavorable weather conditions, that delays or prevents the monitoring from being performed, StarKist shall notify US EPA in writing within 30 days. In the event of a delay, StarKist will complete the monitoring at the earliest reasonable opportunity."

Response: EPA does not include such language for monitoring delays as a standard provision in its NPDES permits. However, EPA retains discretion to work with a permittee in good faith to address such circumstances.

VII. Responses to comments on Priority Pollutant testing

A. Basis and Precedent for annual priority pollutant testing

Response: Contrary to StarKists' comment, monitoring data show significant changes in individual priority pollutants since the Facility's production and processes changed substantially beginning in 2017. Therefore, the permit requires annual monitoring for priority pollutants. Also, based on the most recent priority pollutant scan, which was submitted as part of the permit application update in February 2016, the effluent analyses result for metals and (semi)volatile organics indicates that thirteen (13) metals were detected (e.g., aluminum, arsenic, barium, boron, cadmium, chromium, iron, magnesium, manganese, molybdenum, nickel, selenium, and titanium) along with eight (semi)volatile organics (e.g., methylene chloride, chloroform, benzene, 1,2-dichloropropane, toluene, ethylbenzene, phenol, and bis(2-ethylhexyl)phthalate). Because sulfide, arsenic, cadmium, and bis(2-ethylhexyl)phthalate concentrations were even higher than the applicable criteria for saltwater, it was addressed in the report that additional sampling of the effluent is recommended to further evaluate these results. The other reported pollutant values did not directly exceed applicable criteria, but applying the standard statistical reasonable potential multiplying factor suggests levels of these pollutants may at times exceed the criteria due to the uncertainty caused by the limited number of samples taken. Therefore, it is necessary to monitor these pollutants as part of annual priority pollutant scans, which will provide information to determine reasonable potential in the next permit reissuance.

VIII. Responses to comments on Flow Rate Limits

A. AS-EPA comments on flow limitation in draft permit language

Response: EPA recognizes AS-EPA's position on how the Facility's design and operation interact to impose an indirect flow rate limit separate from the limit set in the permit. EPA's purpose in setting an explicit flow limit is threefold:

- 1) The 'indirect' limitation on flow described by AS-EPA is driven by the Facility's tuna processing capacity, where EPA is focused on the capacity of the Facility's wastewater treatment system.
- 2) The wastewater treatment system could fail to perform with the effectiveness necessary to protect water quality if the total flow volume passed through it were to exceed its treatment capacity.
- 3) The maximum flow limitation authorized in the permit is well in excess of the maximum flow claimed in StarKist's permit application and all reported flows (during rain events or otherwise) during the previous permit term.

Therefore, the maximum flow limit will be retained in the permit to assure protection of water quality, without significant anticipated burden on the permittee.

B. Correcting StarKist's interpretation of flow limit compliance period

Response: As shown in Table 1 of the permit, a maximum daily flow limit of 2.9 MGD has been added, not a maximum instantaneous flow limit. Based on a definition in Attachment A of the permit, "maximum daily limitation" means the highest allowable daily discharge calculated as the total volume of the flow discharged over the day. A footnote has been added to the Table 1 clarifying how standard continuous flow monitoring is to be assessed for compliance with limit on the daily maximum flow.

C. StarKist assertions on rain-driven flow

Response: As noted in response VIII.A(3) above, EPA believes that the flow rate limit as currently set is higher than any flow reported on a recent DMR by the StarKist Samoa Facility, and therefore, there is not a strong basis for concerns that rainfall levels could lead to an exceedance in the future.

IX. Responses to comments related to Ocean Disposal

Response: EPA is aware of StarKist's currently pending ocean disposal research permit under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the underlying assumptions StarKist has made regarding management of the waste streams proposed for ocean disposal. StarKist comments that it reserves the right to seek to reopen the NPDES permit if all of the waste streams in the pending ocean disposal permit are not approved. EPA must consider each permit independently based on the information provided in StarKist's respective permit applications and the controlling federal and AS laws and regulations. EPA's NPDES regulations at 40 CFR § 122.62 (see Permit Part II.A) provide the qualifying bases for EPA to approve any future requests from StarKist to modify and/or revoke and reissue an NPDES permit.