NESTE

23 April 2018

Clerk of the Board, Air Resources Board
ATTN: Mary Nichols, Chair
1001 I Street, PO Box 2815
Sacramento, California 95812

Re: 2018 LCFS Rulemaking

Dear Chair Nichols and Air Resource Board Members:

Thank you for the opportunity to provide comments to the California Air Resources Board (CARB) regarding its proposed amendments to the Low Carbon Fuel Standard (LCFS).

Neste continues its successful strategy of focusing on the production of cleaner transportation fuels. Consistent with our vision to be the preferred partner for cleaner traffic fuel solutions, Neste has become a leader in the production of transportation fuels from renewable feedstocks and is now the largest producer world-wide of renewable hydrocarbon diesel. Neste uses a wide variety of sustainable and renewable raw materials.

Neste supports California's commitment to reducing the greenhouse gas emissions associated with transportation fuel and has incorporated this demand for low-carbon fuels into our business plans. Specifically, Neste has delivered, and plans to continue to deliver, commercial volumes of renewable hydrocarbon diesel (NesteMY Renewable Diesel), which qualifies as a low carbon fuel, to numerous customers in California. Additionally, Neste is commercializing renewable jet fuel (NesteMY Renewable Jet) and looks forward to bringing growing volumes to California's airports.

Stable Program Necessary to Support Capital Investments

Neste, along with many other low-carbon fuel producers, have made significant capital investments in response to the LCFS implementing a demand for renewable or low-carbon transportation fuels. Neste supports CARB's efforts to set an increasing standard beyond 2020. Having an increasing standard will continue to provide forward-looking drivers to incentivise production of low-carbon fuels and additional investment in new, lower-carbon feedstocks, investments in new production capacity, and commercial drivers to attract low-carbon fuels to the California market.

Specifically, Neste supports a target of 30% reductions by 2030 and smoothing the compliance trajectory. This level is attainable and will require continued efficiency increases in staff's ability to complete pathway applications - especially for new and novel feedstocks and production processes - in a timely manner that adequate recognizes the carbon reduction impacts.

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Inclusion of Renewable Jet Fuel

Neste as a producer of low-carbon, renewable jet fuel strongly supports the inclusion of alternative jet fuel in the LCFS program as an opt-in credit generating fuel. Emissions from air travel still remain a significant source of greenhouse gases. Additional strong incentives in the LCFS are necessary to continue to support the efforts of airlines, airports, and international organizations to build an advanced biofuels industry, lower the cost of compliance for obligated parties, and to advance California's carbon reduction goals.

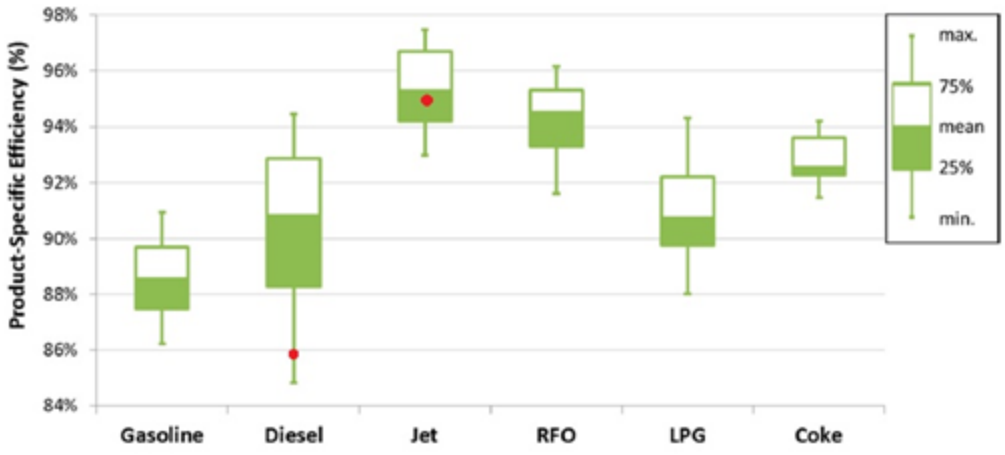
Allowing AJF producers to generate LCFS credits would be a strong positive step in making AJF a cost effective option for air sector carbon reductions. Given that the LCFS is intended to spur investment in the entire renewable fuels industry, we strongly support CARB's proposal to strengthen this investment signal by allowing LCFS credit for all low carbon transportation fuels.

The proposal would also lower compliance costs for regulated parties and is consistent with ARB Resolution 11-39, which seeks to explore the "expansion of the LCFS credit trading market" and "incorporation of a flexible compliance mechanism . . . ." Including AJF in the LCFS credit trading market enlarges the pool of credits available to obligated parties further promoting cost containment. In addition, crediting AJF would assist in lower compliance costs by providing an additional avenue for low carbon fuel use that is unaffected by the blending constraints imposed on ground transportation fuels.

Neste however, notes that the proposal **does not properly set the baseline for traditional jet fuel** and staff should revisit on a technical basis to better reflect refinery efficiency in California and on a policy basis to better account for the market differences between jet and diesel production.

First, from a technical perspective, the proposal has incorrectly calculated the carbon intensity score for conventional jet fuel in California. Based on the CA-GREET3.0 Supplemental Document and Tables of Changes (March 6, 2018), the refining efficiencies used for petroleum jet fuel and ULSD in CA-GREET3.0 are 94.9% and 85.87% respectively. The difference between the two numbers - 9.03 percentage points - is a surprisingly large difference between two middle distillate products produced at the same California refineries. These numbers appear to be based on Linear Programming (LP) results for California refineries provided by Argonne. The reference, Elgowainy et al, indicated in the Supplemental Document includes the following table as Figure 7.

Figure 7. Average product shares (by energy) from major processing units in 43 refineries.



The original table does not include the two red dots which have been added here to illustrate the refining efficiencies used for petroleum jet and ULSD in CA-GREET3.0. Based on this picture, we can see that ULSD refining efficiency used in CA-GREET3.0 represents a value close to the low-end of the diesel range; whereas the jet refining efficiency is close to the mean value of the jet range. The Elgowainy paper also indicates that the difference between production-weighted average efficiencies of diesel and jet fuel is 4.4 percentage points - which is less than half of the difference between refining efficiencies of petroleum jet and ULSD used in CA-GREET3.0.

Elgowainy et al. also write that "The wide range of diesel efficiencies is attributable to the various pathways for diesel production in refineries. When less diesel yield is desired, the production pathway becomes more efficient because a larger share of the diesel product is produced directly from the distillation tower. However, when more diesel production is desired, a larger share of the diesel product comes from the hydrocracker (with extensive hydrogen use), the coker, and the FCC units."

Neste asserts that the same could be said for petroleum jet and CARB should provide more information about the sensitivities of the LP model used. For example; what would be the refining efficiency for the marginal petroleum jet, meaning if jet fuel demand would be higher than assumed.

As the refining efficiency is a key parameter when determining the CI of producing a petroleum product, the following changes should be made to CA-GREET3.0 to reflect the impact of changing the refining efficiency. Two different cases are specified below.

Case A:

- Petroleum jet fuel efficiency changed from 94.9 to 91.1% (91.1% is based on a paper by Palou-Rivera et. al, Updates to Petroleum Refining and Upstream Emissions, Argonne National Laboratory 2011.)
- Refinery still gas consumption to reflect the change in efficiency: JetFuel_WTP Cell: C264 Petroleum!$AV120*(1/B$227-1)/(1/Petroleum!$AU$82-1)

- Petcoke consumption to reflect the the change in efficiency: Sheet: JetFuel_WTP Cell: C260 Petroleum!$AV115*(1/B$227-1)/(1/Petroleum!$AU$82-1)

Resulting CI of conventional petroleum jet is 94.04 gCO2e/MJ.

Case B:

- Petroleum jet fuel efficiency from 94.9 to 86.4%, if which case the difference between ULSD at 85.9 and petroleum jet would be 0.5 percentage points. The difference of 0.5% in refining efficiency of diesel and jet is mentioned in the paper by Palou-Rivera et.
- Same changes as in case A regarding still gas and petcoke consumption

Resulting CI of conventional petroleum jet is 99.00 gCO2e/MJ.

Accordingly, CARB has assumed the refinery efficiency attributable to jet fuel to be approximately 5.5% more efficient than real world operations support. This incorrect assumption inappropriately discounts the carbon reduction benefits of AJF compared to the on-road renewable diesel.

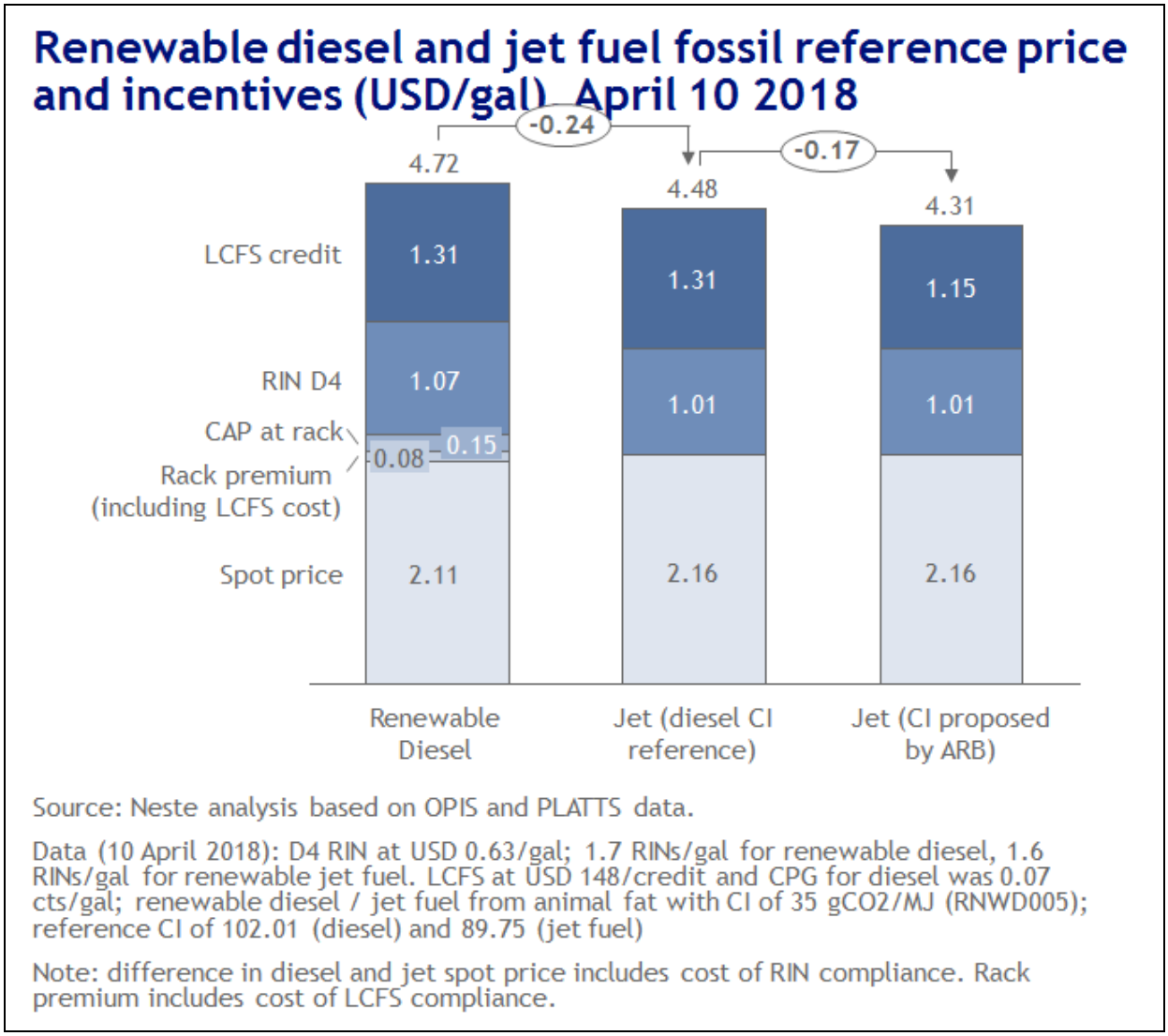
While both cases above show higher baselines with more accurate assumptions about the refining efficientes, Neste contends that the appropriate refining efficiency for use in setting the AJF baseline should be 91.1% as strongly supported and justified in the background including the paper by Argonne. **The corresponding baseline CI for conventional jet fuel is therefore, 94.04 gCO2e/MJ.**

Secondly, CARB should reconsider the shape of the proposed carbon intensity curve as the benchmark for conventional jet fuel from a policy perspective. The LCFS and its proposed amendments have no regulatory mandate to reduce the carbon intensity of jet fuel over time unlike the requirements for diesel and gasoline to reduce their respective carbon intensities 7% and 8% by 2020 and 20% for both fuels by 2030. Removing the decreasing carbon intensity benchmarks for jet fuel would be consistent with the fuel's existing exemption and would appropriately recognize the difference between CARB's regulatory authority over diesel and gasoline and its limited authority to offer incentives to reduce aviation emissions.

It is our impression that staff is acting in an abundance of caution to draw the AJF compliance curve in a highly conservative manner to discount credit-generation opportunities for AJF to avoid incentives to divert AJF from on-road renewable diesel supply to California. Neste, a producer of both renewable diesel and renewable jet, does not intend to cannibalize its renewable diesel business for renewable jet fuel. Rather, the expectation is to expand renewable fuel production capacity. Indeed, Neste is currently studying the feasibility of a new 300+ million gallon per annum expansion of one of its existing refineries and preparing for a final investment decision later this year.

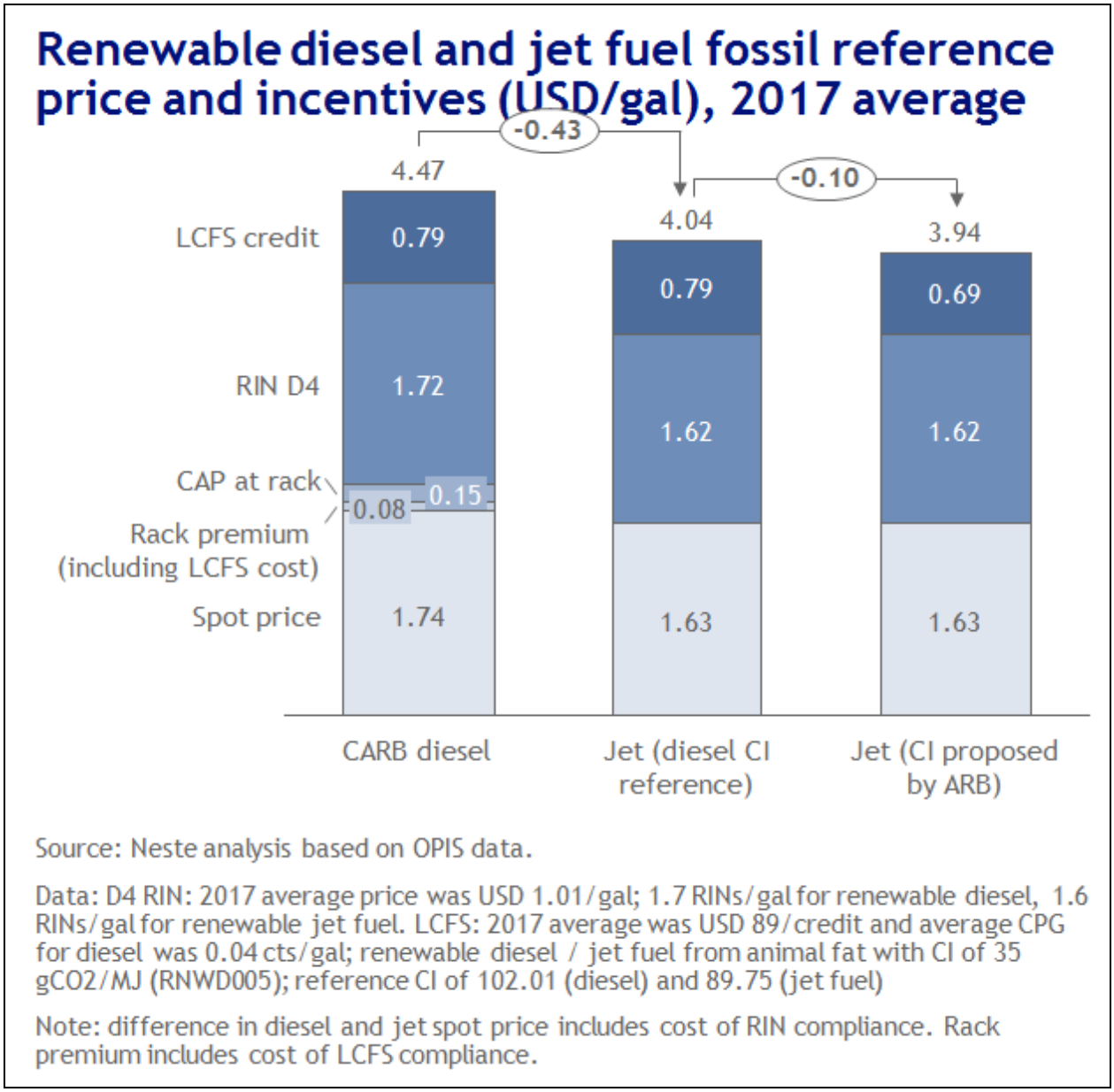
A review of existing market and policy factors clearly demonstrates that decreasing the carbon intensity benchmark for jet fuel is not needed to prevent market distortions given the many factors (including including production economics, fuel specifications, market forces, other California climate policies, and the federal Renewable Fuel Standard) that will still place AJF at a market disadvantage, and the fact that

AJF production also necessarily results in the production of other fuels within a product slate. The charts below summarize current price and market data.



Assuming the proposed conventional jet CI baseline (89.75), renewable diesel would currently have a 40 cents/gal higher incentive than renewable jet fuel.

Similar trends hold for historical data as well. The following chart shows 2017 average price comparison.



In 2017 renewable diesel would have had a 40 cent/gal higher incentive than renewable jet fuel, even if same fossil reference CI value is used. The proposed, lower CI baseline would have further discounted the AJF relative to the on-road renewable diesel by an additional 10 cents/gal.

Taken as a whole, these factors demonstrate that AJF production will remain significantly disadvantaged from a producer vantage point compared to on-road fuel even after AJF becomes eligible to generate LCFS credits. ARB should closely examine this economic framework and recognize that it provides ample protection to California's renewable diesel supply; and therefore establish LCFS crediting parity for AJF production.

Neste proposes a benchmarking approach that would be more consistent with ARB's regulatory authority to establish a fixed baseline standard for conventional jet fuel - rather than a declining standard. This would remain consistent with the fuel's existing exemption and opt-in status and would appropriately provide a voluntary incentive, but not mandatory regulatory standard, for the aviation sector. The baseline would be fixed at the 2010 conventional jet fuel baseline (94.04 gCO2e/MJ considering updated refinery efficiencies). As noted above, staff's proposed approach is likely motivated by a desire to create a level playing field with ground transportation fuels. The benchmarking proposals suggested above would maintain a level playing field as they would not result in greater LCFS incentives for AJF than diesel substitutes.

Further in order to avoid an LCFS crediting mechanism that disproportionately incentives low-carbon aviation fuel over low-carbon on-road fuel, the **AJF baseline could further decline in tandem with the diesel standard when the diesel standard crosses and is equal to or lower than the 2010 conventional jet fuel baseline**. This would provide early year incentives to continue to send strong support and incentive signals to producers of renewable diesel and renewable jet fuel, would recognize the inherent and existing economic discrepancies between jet and on-road diesel, and would avoid inappropriate and unintended incentives away from on-road diesel in later years when the diesel baseline declines below the 2010 conventional jet baseline.

Other Opt-In Fuels

Neste supports the inclusion of fuel used in military tactical vehicles and support equipment on an opt-in basis. Disallowing fuels from generating credits because solely because of end-use application has unnecessarily increased logistic costs and has overly complicated supply decisions. Allowing otherwise credit-generating, low-carbon fuel to generate credits supports the expansion of low-carbon transportation fuels in California and the growing diversity of the State's fuel supply; and allows military uses to be included in the growing demand for low-carbon fuels.

Third-Party Verification

Neste renews its support that CARB authorize third-party verifiers, who are unrelated to the applicant, to perform due diligence on the proposed pathway applications and verify the CI modeling and calculations. The role of CARB staff would then be focused on oversight and verification.

However, the full details of the current staff proposal do not take proper advantage of existing experience from other jurisdictions and established certification schemes. Many of these schemes work efficiently, have adequate technical competencies already established, work globally, and can react quickly to market changes. Regulating authorities can efficiently control certification schemes. Utilizing existing certification schemes would not remove the ARB's control and would not give away its responsibilities.

Many producers who participate in other markets already participate in one or more other verification system. Implementation of an additional, California-specific system is inefficient and will lead to significant additional costs for producers as verification/certification for different markets will require multiple, overlapping audits. To the greatest extent possible, Neste recommends that California fuel reporting entities be allowed to utilize existing certification schemes that can accomplish the LCFS verification requirements.

In Section 95491.1, staff proposes to increase the record retention period from five to ten years but fails to provide adequate rationale to support such a large increase burden on reporting parties. Rather, the inclusion of required, more regular third-party verification should reduce the risks associated with incorrect reporting and record-keeping. The record retention period should not be increased.

ADF

Neste supports staff's efforts to respond to the court's concerns about NOx addressed in the writ of mandate in the *POET* lawsuit. Neste believes that the supplemental environmental analysis included in Appendix G is adequate and that it together with the additional ADF sunset requirements comprehensively addresses the potential of LCFS-driven biodiesel NOx emission impacts.

Definitions

Neste supports ARB's efforts to attempt to distinguish between different grades of waste oils. However, the terms "Brown Grease", "Used Cooking Oil", and "Yellow Grease" do not align with normal and industry-standard nomenclature and have the strong potential to create confusion and increase misidentification between commercial parties and the regulatory expected documentation. Neste instead proposes that the terms be used interchangeably (as the are used commercially) and that the processing and mixing differences in the supply chain that the proposed definitions appear to be contemplating instead be documented via the verification efforts.

Table 8, Temporary Pathways for Fuels with Indeterminate CIs, identifies "Fats/Oils/Grease Residues" but fails to define the term. Neste proposes that the definition should be added as follows: "Fats/Oils/Grease Residues include, but are not limited to, processing residues that are not the main product of the production process, neither from a technical nor an economical perspective to the total production process."

CONCLUSION

Neste appreciates the opportunity to comment on teh 2018 LCFS amendments. Like California, Neste is proud of its leadership in producing clean transportation fuel. While no one producer or type of low-carbon fuel will be able to satisfy the State's carbon reduction and air quality improvement goals in the near term, Neste believes that its efforts, along with other like it, can positively contribute to the success of the Low Carbon Fuel Standard.

We look forward to continued participation in the California fuel market and the continued success of the Low Carbon Fuel Standard. As always, do not hesitate to contact me at 281.788.1662 or Dayne.Delahoussaye@neste.com if you have any questions regarding the foregoing.

Respectfully submitted

Neste US, Inc.

Dayne Delahoussaye