SUMMARY OF OPINIONS OF WILLIAM F. PRECHT

May 9, 2023

William F. Precht, of Dial Cordy and Associates, Inc. is a marine scientist who has devoted his career to the health and preservation of coral reefs throughout the world. A copy of Mr. Precht's C.V. is attached.

A. Assignment: To Objectively and Scientifically Determine if Cruise Ship Generated Turbidity Harms Bethnic Resources in Key West

Over the last two years, Mr. Precht and his team have been working and doing research in the Key West Harbor and Ship Channel. This scientific research included observing cruise ships entering the ship channel and docking at Pier B and Mallory and making dives to physically examine coral and view fish, mammals and other bethnic resources in these areas. The purpose was to determine if there has been, or is, any adverse impact on these biological resources and the reefs in the Key West area because of the turbidity generated by cruise ship arrivals and departures.

B. Preliminary Results

Mr. Precht made a presentation to the Commission in April of 2022, at the same meeting that Dr. Crosby from Mote Marine addressed the turbidity question with the Commission. At another Commission meeting last year, Mr. Precht provided the Commission with a written presentation of his preliminary finding that cruise ship generated turbidity causes no harm to the coral reefs or bethnic resources in Key West and the surrounding areas

C. Opinion

Mr. Precht's opinion is that the temporary and rapidly dissipating turbidity caused by cruise ships has not and does no harm coral, fish mammals or other bethnic resources in the Key West area.

D. Current Observations of Healthy of Coral, Schools of Tarpon and Bethnic Resources Under and Around Pier B and Other Cruise Ship Docks

In 2007 and 2020, Dr. Phil Franks of Terramar performed "Bethnic Resource Assessment" of coral populations, for the City, at Mallory and took numerous photographs of coral. Dr. Frank's pictures showed healthy and thriving coral populations under and around the Mallory cruise ship dock.

Mr. Precht intentionally located and observed many of the same coral populations observed by Dr. Franks, and photographed them in 2021, showing that their health had not changed, that they were normal, and some had grown. Much of the coral populations observed by Mr. Precht and Mr. Franks are 10 years are older, with some as old as 25 years.

Based on numerous dives in 2021 and 2022, and Mr. Precht's expert observation, he confirmed the health and vitality of coral and other bethnic resources in the Key West Harbor, at Pier B, Mallory and the Navy Mole

cruise ship docks. In fact, Mr. Precht has found that he coral he observed under Pier B, and in these other cruise ship docking areas and adjacent harbor is some of the healthiest coral he has seen in the Florida Keys National Marine Sanctuary.

Mr. Precht has observed dozens and dozens coral, that are listed as threatened on the U.S. endangered species list, throughout these areas, many of which are decades old including those recently referred to by SCS in its May 8 letter to Mayor and Commission. Mr. Precht's opinion applies equally to the coral referenced by SCS and all listed species, and none have been affected or harmed by cruise ship turbidity. The health of these listed coral was also confirmed by Dr. Franks earlier reports.

At these locations, and specifically under Pier B, even shortly after cruise ship docking and departures, Mr. Precht repeatedly observed, day in and day out, the presence of tarpon schools, large schools of other sport fish including snapper and large individuals of goliath grouper and sharks. At these locations, Mr. Precht also saw bottle nosed dolphin and manatee populations regularly. including days that cruise ships were in port.

Mr. Precht has taken pictures documenting these facts and included are pictures he presented in April of 2022.

E. Scientific Basis for Mr. Precht's Opinion

Mr. Precht was asked to provide scientific data and information backing up his opinion that cruise ship generated turbidity has not and will cause no harm nor adverse effects on the barrier reefs, patch reefs or bethnic resources in the Key West harbor.

As stated earlier, Mr. Precht found that much of the coral he observed was over ten years old, many have been growing for 20 – 25 years, or more, and are healthy. This is significant because there have been over 7,000 cruise ship visits to Key West over that same 25-year period. If cruise ship traffic actually harmed coral in the harbor, this would be an impossibility.

Mr. Precht explains the specific and documented science establishing that cruise ship generated turbidity can have no such adverse effect:

> Based on scientific studies, and the law of physics, 95% of the sediment disrupted by cruise ships passage settles out in 150 meters (approximately 500 ft). The remaining 5% settles out and there is no remaining sediment disruption

by 750 meters (.46 miles). This has been confirmed as occurring in Key West (with insignificant variations at times from currents and weather).

The practical impact of this observation is that turbidity generated by cruise ships docking at and departing from Key West cannot physically reach any reef. More important cruise ship turbidity is short term, typically fully dissipating in no more than 45 minutes. There is simply no scientific evidence, in any of the areas Mr. Precht studied, that cruise ship turbidity caused any harm to coral, fish and other bethnic resources that were directly exposed to this turbidity. Mr. Precht further opined:

- The location of the closest coral reef, along the Florida Reef Tract at eastern Dry Rocks, is slightly more than two miles (3,218 meters) away from the sea buoy marking the entrance to the Key West ship channel. We have directly measured turbidity at the reef at Eastern Dry Rocks when cruise ships have passed and have observed no plumes or increased turbidity reaching the reef.

- As to the isolated patch reefs within Hawks Channel which are adjacent to the ship channel, most are more than a mile from the channel. However, there are a few that could be in an area that could potentially see the brief passage of a turbid plume by the passage of a large vessel in the main ship channel (see Appendix A). However, our in-water diver observation and turbidity readings reveal that while this area is a sediment sink, these patch reefs are in far better condition (higher coral cover and diversity) than those of the main reef tract. Repeated measures photo monitoring of individual corals shows some of the best coral colonies near Key West.

- The community seems to have concerns about the sediment disrupted by cruise ships on docking and departure at the cruise ship docks within Key West Harbor. We have all seen the SCS pictures. However, the disturbed sediment settles out quickly usually in minutes (10-45 minutes based on wind, tides, and how long the ship used its thrusters to maneuver within the harbor). Yet we have been told that cruise ship turbidity at the docks is killing coral and seagrass and has chased away tarpon and other fish species. *Nothing is further from the truth*. In two Reports I have Included underwater photographs of healthy coral, sponges, seagrasses and schools of tarpon and other fish living under and around Pier B at Mallory. In fact, the coral community living in Key West harbor is one of the healthiest and most diverse coral assemblages remaining within the Florida Keys National Marine Sanctuary. I have attached a few photos.

F. Conclusion

After two years of scientific observation and analysis, by one of the top coral reef experts in the world, Mr. Precht it determined that cruise ship generated turbidity is not causing harm to reefs, coral, fish, mammals or any other bethnic resources in the Key West Harbor or area.