

of PWC have exceeded estimates for conversions and are proceeding at a greater rate than forecast by the EPA, there is no sales data available at this time indicating the engine conversion at Glen Canyon is proceeding at a faster or slower rate than the EPA forecast. Therefore, use of the EPA rates is considered appropriate, and use of an accelerated rate may be considered speculative without additional supporting data.

The second assumption by the commenter is that 75% of the non-rental PWC at Glen Canyon will have engines that comply with the CARB conversion rule for all years, which requires that marine engine emission reductions targeted by the EPA for 2006 be achieved in California by 2001. The California rule then requires further emission reductions by 2004 and 2008 (Title 13, California Code of Regulations, sections 2440–2448). The commenter assumes that 50% of the PWC users at Glen Canyon will be from California and all will have CARB-compliant watercraft, and that, because of manufacturing and sales efficiencies outside of California, an additional 25% of the Glen Canyon PWC users will have CARB-compliant watercraft. The National Park Service concurs that many watercraft users at Glen Canyon have California-registered PWC, and that they will meet the CARB standards. However, there is no data relative to PWC at Glen Canyon to confirm the 75% figure assumed by the commenter. The National Park Service emission calculations are conservative only in the sense that they do not specifically account for watercraft that have already been or will be converted to meet CARB standards. Under the modified preferred alternative B, PWC used in the recreation area after 2012 would be 100% compliant with the EPA 2006 emissions standards for the manufacturing of gasoline marine engines.

45. Continued PWC use on Lake Powell under the proposed rule will not pose any adverse health risks for park visitors under even the “worst case” airborne PAH concentrations that could theoretically be generated by the vessels.

NPS Response: The commenter submitted an analysis of PAH emissions at Glen Canyon to support the comment. The commenter’s analysis uses many conservative assumptions and a pollutant dispersion model to conclude that PAH exposure to PWC users from PWC PAH emissions would be less than one thousandth of one percent (<0.001%) of an Occupational Safety & Health Administration (OSHA) limit for

PAH exposure. Shoreline exposure would be even lower. OSHA published the limit as part of a discussion of safety and health related to coal tar pitch volatiles. The limit is for total PAH, and the comment in reference to OSHA for limits of coal tar volatiles does not apply in the context of the Glen Canyon PWC rule-making discussion. In addition, another relevant study concluded that there are some health effects associated with PAH emissions (see Environmental and Occupational Exposure to Toxic Air Pollutants from Winter Snowmobile Use in Yellowstone National Park, Kado *et al.* 2001). Therefore, the National Park Service cannot support a conclusion, as the commenter suggests, that PWC use at Glen Canyon would pose no adverse health risks from toxic air pollutant emissions.

46. One commenter believes that the analysis reference to moderate levels of air quality impacts from HC, NO_x, and carbon monoxide (CO) emissions associated with PWC use is incorrect and potentially misleading. The commenter believes that these emissions, even under the “worst case” scenario, would not pose a health risk for park visitors.

NPS Response: Emission levels shown in the Air Quality analysis tables in the “Environmental Consequences” chapter are not directly comparable with the emission levels submitted by the commenter, because the National Park Service Air Quality Division calculates emissions on an annual basis, and the commenter’s calculations are for an average boating day during the boating season. Some assumptions made for National Park Service calculations are more conservative than those used for the commenter’s calculations. The National Park Service assumed that the conversions from carbureted two-stroke engines to cleaner engines would occur at the rate forecast by the EPA. Based on the National Park Service model (presented in the tables as tons per year of estimated hydrocarbon and nitrogen oxide emissions for all alternatives), a 21.6% conversion is assumed from 1998 levels by 2004 and a 58.4% conversion by 2012. The commenter assumes a faster conversion. The commenter assumes that emissions would be reduced because a significant portion of PWC would be cleaner than EPA requirements due to compliance with the more restrictive California requirements. There is no data relative to PWC at Glen Canyon to confirm the 75% figure that is assumed by the commenter. The National Park Service emission calculations are conservative only in the sense that they do not

specifically account for watercraft that have already been or will be converted to meet either CARB or EPA standards. Under the modified preferred alternative B, PWC used in the recreation area after 2012 would be 100% compliant with the EPA 2006 emissions standards for the manufacturing of gasoline marine engines, which would result in a substantial reduction in emissions. Using the EPA forecast rate of emission reductions in the National Park Service air quality emissions model, and assuming a 2% annual visitor growth rate, the PWC emissions associated with the modified preferred alternative would be up to 365 tons per year of HC + NO_x by 2012 and 2,955 tons per year of CO, which is considered by the National Park Service to be a moderate adverse effect.

47. One commenter stated the National Park Service analysis does not reflect the increase in nitrogen oxides emissions that are likely with the conversion to more four-stroke engines.

NPS Response: The Draft and Final Environmental Impact Statements do note in the “Air Quality” section of the “Environmental Consequences” chapter that nitrogen oxide emissions will increase with implementation of the EPA 1996 rule and the conversion to 4-strokes. However, there would be sizeable reductions in emissions such as VOC, HC, PM and CO and overall air quality in the recreation area would continue to be below national ambient air quality standards.

48. One commenter stated the National Park Service analysis does not reflect CARB research which found that four-stroke PWC emit more carbon monoxide (CO) pollution than do conventional two-stroke machines. The commenter states that the National Park Service should be concerned with any technology that emits large amounts of this pollution given the recent spike in carbon monoxide-related deaths at Glen Canyon National Recreation Area.

NPS Response: The CARB 2001 study, Outboard Engines and PWC Emissions to Air and Water: A Laboratory Study found that CO emissions from four-stroke outboard and PWC engines tested were lower than conventional two-stroke engines. The CARB results indicate that the carbureted two-stroke PWC engine tested emitted nearly three times the amount of carbon monoxide than did the four-stroke engine. Results also indicated that the four-stroke outboard engine emitted lower levels of carbon monoxide than two-stroke carbureted outboard engines with exception of the two-stroke 90 hp direct-injected engine, which emitted lower