DIRE Coalition Testimony: EPA Public Hearing on Lahaina Wastewater Injection Permit - Lahaina Civic Center - August 20, 2009

Thank you, EPA Hearing Officers. The DIRE Coalition is a group of Maui county residents, visitors and organizations, who seek to protect the County's reefs, public health, and economy by urging the County to phase out wastewater injection wells, improve wastewater treatment, and reclaim and re-use properly treated wastewaters on land for a variety of beneficial uses.

We applaud the visionary goal of 100% wastewater reuse and zero injection that Mayor Tavares announced on May 22, 2009. We are here to support the Mayor's goal and to ask EPA, the Mayor, the County Council, and the Department of Environmental Management to work together to achieve this goal as soon as possible. At the November 2008 EPA hearing, the testimony was unanimous: every public witness and all those present made clear on the record their support for ending Maui's discard of wastewater into injection wells that run into the ocean and for reusing adequately treated wastewater as a valuable resource on land.

Since that time, EPA has revised its proposed permit in beneficial ways, but the proposed permit would allow 10 more years of wastewater injection without ensuring sufficiently higher levels of treatment and reuse of the wastewater. That is why we cannot support the revised permit proposal. Again, public opinion has been nearly unanimous: the record shows nearly 200 groups and individuals opposed to the proposed revised permit for this overriding reason – as well as others.

For the record, we have specified the basis for our concerns with EPA's revised proposal in written testimony which we have submitted. Here we will provide only the highlights and major conclusions of those thoroughly documented comments. Overall, we make four main points:

(1) EPA should not grant a 10 year injection permit at Lahaina, which in 2019 may leave us no closer to realizing the Mayor's goal than we are today. In our view, any permit for injection at Lahaina must be conditioned on a number of specific requirements leading to achievement of the Mayor's goal as promptly as possible. The essential conditions include: (a) reductions of nitrogen and phosphorous levels and effective disinfection of pathogens; (b) effective monitoring of ground and ocean water quality and bio-impact and public reporting; (c) within one year, development and submission to the public and EPA of a detailed plan with benchmarks of progress for design, financing, construction and operation of necessary treatment upgrades and wastewater re-use facilities, and (d) phase out of the injection wells as soon as possible but in no event later than January 1, 2015;

(2) EPA should require the County to submit an expedited compliance schedule for obtaining an NPDES permit for the injection wells discharges to the ocean as a condition of any UIC permit that the Agency may approve;

(3) EPA may not (and should not) grant a UIC permit which authorizes behavior that is expressly prohibited by the Clean Water Act – that is, discharge of pollutants into the ocean through the wells without an NPDES permit; and

(4) EPA should not grant the Lahaina permit until the State has provided the certification required by section 401 of the Clean Water Act, including the effluent limitations and other requirements necessary to ensure compliance with all applicable State constitutional and

regulatory policies and requirements. These too should be added as conditions to any permit EPA may grant.

As a result of the Nov. 2008 hearing and extensive research since then, we have learned many important things relevant to this hearing. These things are documented fully in our written testimony. Here are the highlights and headlines.

1. The wastewater effluent going into the Lahaina injection wells does not stay in the wells, but migrates into the ocean. That is now indisputable.
2. The wastewater effluent contains high levels of nitrogen. The nitrogen fuels algal growth, which in turn contributes significantly to the decline of coral reefs. While nutrient releases from county injection wells are not the only cause of reef decline, a compelling body of scientific information – over 20 sources since 1993, including reports from the National Academy of Sciences, DAR, EPA, and U of H – implicate(s) the county injection wells at Lahaina, Kihei, and Kahului as significant contributors to serious reef decline.
3. The proposed revised permit would allow over 800,000 additional lbs of nitrogen to go into these wells and into the ocean over the permit's 10 year life. This is too much.
4. These releases to the ocean through the injection wells without an NPDES permit constitute a violation of section 402 of the Clean Water Act under the "significant nexus" doctrine of the Rapanos and Northern California River Watch cases. EPA should not – we believe may not lawfully -- issue a permit under the Safe Drinking Water Act which authorizes illegal behavior under the Clean Water Act. Knowing these things, EPA should require the County to obtain an NPDES permit under the Clean Water Act as soon as possible.
5. Over 1900 other communities throughout the US are now raising levels of treatment and reusing more of their wastewater instead of discarding it into oceans or streams. They have found ways to pay for this.
6. We know that the injection wells at Lahaina cannot be shut down until there is a viable alternative, but a strict time table needs to be set, as a condition of the permit, for developing that alternative. The County has not borne its burden of proof, and the record provides no basis to conclude, that 10 more years of injection is necessary or desirable. Again, we are pleased by the Mayor's decision to seek only a five year permit at most.
7. We believe that within one year, Maui County can establish a plan, schedule, and required benchmarks of progress for design, financing, and construction of the wastewater treatment upgrades and the facilities needed to safely and beneficially reuse the effluent on land. We believe five years is adequate to complete the process. See Appendix 6 to our written testimony.
8. The DIRE web site – dontinject.org – lists a number of communities in which this has been accomplished, including Prescott, Arizona, which auctioned off rights to its reclaimed wastewater effluent for up to $67 million.
9. Our web site also references federal grants of 10s of millions of dollars made in the last year to help alleviate drought and enable communities to improve treatment of wastewater and reuse of the effluent. Moreover, the County estimates that necessary improvements would cost no more than 3-5% increase in wastewater management fees. Planned development can also help pay these costs.
10. Working together, we are confident that we can achieve the Mayor's goal. For the reasons stated here and elaborated on in our written testimony, we of the DIRE Coalition urge EPA not to move forward with the proposed revised permit, but instead to work with all concerned parties, to develop a permit that includes compliance with the Clean Water Act, and a binding schedule for realizing the Mayor's goal – no longer than 5 years at Lahaina.
11. We not only believe this is wise policy; we believe this is the only permissible outcome based on the applicable federal and state law and the record of this proposed permit.
12. The costs of ensuring re-use will only increase over the next 10 years, and as the Appendices to our testimony show, we can find the funds if we have the will to take action NOW to protect our reefs and preserve our precious water resources for safe and beneficial on land reuse.

DIRE Coalition Testimony
On the Lahaina Injection Well UIC Permit Application –
Lahaina Civic Center – August 20, 2009

Thank you, EPA Hearing Officers. The DIRE Coalition is a group of Maui county residents, visitors and organizations, who seek to protect the County's reefs, public health, and economy by urging the County to phase out wastewater injection wells, improve wastewater treatment, and reclaim and re-use properly treated wastewaters on land for a variety of beneficial uses. DIRE stands for Don't Inject, RE-direct, and we chose that name, because the situation truly is dire. We cannot continue business as usual if we want healthy reefs and abundant water for Maui.

We applaud the visionary goal of 100% wastewater reuse and zero injection that Mayor Tavares announced on May 22, 2009. We are here to support the Mayor's goal and to ask EPA, the Mayor, the County Council, and the Department of Environmental Management to work together to achieve this goal as soon as possible. That is our overriding goal. Secondarily, we seek to inform EPA and the public and help ensure that the proposed revised permit does not go forward without a number of very important and substantial improvements

At the November 2008 EPA hearing, the testimony was unanimous: every witness and all those present made clear on the record their support for ending Maui's discard of wastewater into injection wells that run into the ocean and for reusing adequately treated wastewater as a valuable resource on land.

Since that time, EPA has revised its proposed permit in beneficial ways, but the proposed revised permit would allow 10 more years of wastewater injection without ensuring reuse of the wastewater. That is why we cannot support the revised permit proposal in its present form. Again, opinion has been nearly unanimous with regard to the proposed revised permit: the record shows nearly 200 groups and individuals opposed to the proposed 10 year revised permit for this overriding reason – as well as others.

In this submission we make clear the basis for the DIRE Coalition's concerns and set forth what we think needs to be done and why, and why the proposed revised permit is not yet improved sufficiently to protect the reefs, reduce the impact of Maui's water shortage, or conform with applicable legal standards and public wishes. We also indicate that changes that are necessary for an acceptable permit to be granted.

I. EPA should decline to approve a 10-year renewal permit for Maui County to continue to discharge inadequately treated wastewater effluent into the injection wells, which then flows into the ocean, stimulates algal growth, harms coral reefs, and releases pathogens that threaten the health of those who swim, snorkel, dive, and work in the near shore waters.

1. **EPA is not required to grant Maui County's application for a 10 year underground injection permit, but is expressly authorized to grant a UIC permit for a shorter term.** Under the terms of 40 CFR 144.36 (a) any permit granted "shall be for a fixed term *not to exceed 10 years*." Under subsection (c) of that section, the

Agency clearly "*may issue any permit for a duration that is less than the full allowable term* under this section."

2. **The burden of proof under the federal Administrative Procedures Act, the federal Safe Drinking Water Act, and the Hawai'i State Constitution is on the applicant for a renewal as well as a new underground injection permit, not those who oppose the issuance of the permit or the requested terms of it. In this case, the proponent of the injection well permit renewal application is the County of Maui.**

   (a) Under 5 USC sec. 551 [the federal Administrative Procedure Act or APA]: EPA is an "agency" within the meaning of paragraph (1). The pending process for considering Maui County's application for a 10 year permit to inject wastewater under the federal Safe Drinking Water Act is a "licensing" process under paragraph (10). Any permit that issues from that process is a "license" within the meaning of paragraph (9) and an "order" under paragraph (6). Therefore, this underground injection permit proceeding constitutes an "adjudication" within the meaning of paragraph (7) of section 551.

   (b) Under EPA regulations governing underground injection wells, 40 CFR 144.31 (a), "Unless an underground injection well is authorized by rule under subpart C of this part, all injection activities including construction of an injection well are prohibited until the owner or operator is authorized by permit." Plainly, without a UIC permit under the Safe Drinking Water Act, underground injection of the wastewaters at the County's Lahaina plant would be illegal. As the Court explained in US Steel Corporation v. Train, 556 F.2d 822 (7th Cir. 1977), "[Section] 558(c) of the APA provides, independently of § 554 of that Act, that '(w)hen application is made for a license required by law' the agency shall hold proceedings which shall be "conducted in accordance with sections 556 and 557." This is such a proceeding and so section 556 applies.

   (c) Title 5 USC, sec. 556(d) provides, "*Except as otherwise provided by statute, the proponent of a rule or order has the burden of proof."* There is nothing in the Safe Drinking Water Act that "otherwise" provides for a shifting of the burden with respect to Underground Injection Control permits under that Act. Similarly, when the courts have examined permitting requirements under the comparable Clean Water Act, for example, they have concluded that 5 USC 556(d) applies to permitting procedures even when statute does not require the decision to be "on the record". See US Steel Corporation v. Train, 556 F.2d 822 (7th Cir. 1977).

   (d) In this proceeding the applicant for the permit "or order," the County of Maui, is the "proponent" of the "order" and thus has the burden of proof. See US Steel Corporation v. Train, 566 F.2d 822 (7th Cir. 1977): "U.S. Steel, as the applicant for a permit without which it would be forbidden by law to discharge pollutants, is the proponent. See also Appalachian Power Co. v. Train, 545 F.2d 1351, 1358 (4th Cir. 1976)."

(e) The "burden of proof" imposed by 5 USC 556(d) is not mere the burden of going forward or producing a prima facie case, but has been interpreted by the US Supreme Court to mean the "burden of persuasion." Director, Office of Workers' Comp. Programs v. Greenwich Collieries, 512 U.S. 267, 276 (1994). See also: National Mining Association v. United States Department of the Interior, 251 F.3rd 1007 (DC Cir. 2001).

(f) Similarly, as the Hawaii Supreme Court found In the Matter of Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waihole Ditch Combined Contested Case Hearing (2004), "'Under the public trust [doctrine of the Hawai'i Constitution] and the Code, permit applicants have the burden of justifying their proposed uses in light of protected public rights in the resource.' Waihole I, 94 Hawai`i at 160, 9 P.3d at 472. The Water Code requires, inter alia, that the applicant prove that the proposed use of water is a "reasonable-beneficial use" and is 'consistent with public interest.'" – http://hawaii.gov/jud/24873.htm. The Hawai'i Supreme Court's 2000 decision in Waihole I explained further, "In practical terms, this means that the burden ultimately lies with those seeking or approving such uses to justify them in light of the purposes protected by the [public] trust. Cf. Macron, Inc. v. Commonwealth Dep't of Envtl. Resources, 462 A.2d 969, 971 (Pa. Cmwlth. Ct. 1983) (maintaining that, given the "special concerns involved in this area of the law," i.e., the public trust, the petitioner and the agency had the duty to justify the permit); Commonwealth Dep't of Envtl. Resources v. Commonwealth Pub. Util. Comm'n, 335 A.2d 860, 865 (Pa. Cmwlth. Ct. 1975) (holding that, once adverse impact to the constitutional public trust is raised, "the applicant's burden is intensified," and the agency and reviewing court "must be satisfied that the [relevant constitutional test] is met"). In the Matter of the Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waihole Ditch Combined Contested Case, No. 21309 (HI Supreme Court 2000). – http://www.state.hi.us/jud/21309op.htm

3. **In the current situation the County's burden of proof of the need for a 10- year permit to continue injecting wastewater effluent at Lahaina without any plan for achieving greater wastewater reuse during or after that period is heavy,** because:

(a)The Mayor of Maui has stated that the County's goal is "to use all of the water that's produced by our treatment plants and not put it down any injection wells. That's our goal." Statement at Dowling Company Wastewater Treatment/Reuse Facility Blessing, May 22, 2009;

(b) The federal Pollution Prevention Act of 1990 – the Policy Statement in section 6602(b) – makes clear that "disposal" or discarding a waste stream is the least desirable environmental option – "disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner" and that recycling or reuse is clearly preferred as a matter of federal policy. http://epw.senate.gov/PPA90.pdf;

(c) The fact that the Safe Drinking Water Act itself was intended to be administered in accordance with the precautionary principle: "The statute's precautionary purpose is clear. . ." Miami-Dade County v. USEPA, 529 F.3d 1049 (11th Cir., June 6, 2008) – http://www.ca11.uscourts.gov/opinions/ops/200610551.pdf

(d) The Hawaii State Constitution imposes a duty on the County (as well as the State) to treat all waters of the state as a "public trust." Kelly v. 1250 Oceanside Partners, 111 Haw. 205, 140 P.3d 985 (July 28, 2006). Discarding a potentially valuable resource (nutrient laden water) in a period of water shortage and multi-year drought is inconsistent with the "public trust" duty of the County and the Hawai'i state constitutional mandate to "conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and . . . promote the development and utilization of these resources in a manner consistent with their conservation. . . " See Appendix 2 to these comments and the constitutional and regulatory provisions, and cases cited there.

(e) Likewise, the State's Water Pollution Control Law provides that: "No person, including any public body, shall discharge any water pollutant into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the director." §342D-50 (a). The permit being an exception to the general prohibition of discharges of water pollutants into state waters, it is incumbent on the permit applicant to bear the burden of proof with respect to all material issues of fact on which issuance of the permit depends. See United States v. First City Nat'l Bank, 386 U.S. 361, 366, 87 S.Ct. 1088, 1092, 18 L.Ed.2d 151 (1967) (party seeking benefit of exemption from statute bears burden of proof); and Equal Employment Opportunity Commission v. Kamehameha Schools/Bishop Estate, 990 F.2d 458 (9th Cir. 1993). The same principle applies here.

4. As shown below in Point II below, to grant the revised permit would allow 10 more years of harmful indirect discharge of pollutants to the ocean without an NPDES permit under the Clean Water Act in violation of that law and of state constitutional and regulatory policies. See J. Kennedy's opinion in Rapanos *v.* US, 547 US 715 (2006), and Northern California River Watch v. City of Healdsburg, 457 F.3d 1023, 496 F.3d 993 (9th Cir. 2007);

5. As show below in Appendix 1, the continued release of nitrogen laden pollution to the ocean through these wells even under the terms of the permit proposed by EPA (and opposed by the County) will further threaten the coral reefs on Maui, which are at or near the tipping point for "complete catastrophic collapse."

6. The continued release of these wastewater effluent into the ocean through the wells and into the ocean violates the water quality standards, classifications and policy of Hawaii Administrative Regulations 11-54 and 11-55;

7. The County has been suffering from a multi-year drought and water shortage. See Appendix 3. Under these circumstances, the proponent of continued discard of

valuable water resources rather than reclaiming and beneficially reusing them must demonstrate a compelling need for continued injection.

8. Maui County has not provided any data as to how it would use the requested 10 years to devise an alternative system to the current injection wells that would improve treatment; better protect the ocean, the reefs, and the public health; or promote reclamation and reuse of the wastewater effluent. Thus, if the proposed revised permit were granted, at the end of the requested 10 years we would likely be in the same situation as we are today only with even more degraded reefs and a more costly construction project to pay for.

9. **The County of Maui has not come anywhere close to bearing its burden of proof that a 10-year UIC permit is necessary, desirable, and in the public interest. Nor has it offered any explanation of why a 10 year permit is needed, beneficial or preferable to a shorter permit to give the County sufficient time to design, finance and build wastewater reuse facilities that could enable it to shut down these wells.** The County has not even addressed most of the points in this testimony (let alone done so in a persuasive way), while the opponents of a 10-year permit have presented in this record ample justification – legal citation, scientific and policy information – as to why a 10 year UIC renewal permit is not in the public interest, is not necessary, and should not be approved. *In fact, nothing has been submitted by the County in its application for the permit or in its June 23, 2009, letter to EPA to explain why a 10 year permit is necessary or even desirable.* No factual information has been submitted in support of the duration of its requested permit. (See: http://www.epa.gov/region09/water/groundwater/uic-pdfs/lahaina02/Maui_CountyComments.pdf) The County apparently has *assumed* that it is entitled to a 10-year renewal of the permit.

   But as 40 CFR 136(a) and (c) plainly demonstrate, a 10 year permit is not a right or an entitlement, but is within the discretion of the Agency to grant on terms that protect the public interest. See also the following examples of UIC permits that EPA has granted for less than 10 years:

   - Class V Experimental Underground Injection Control Permit #CA5060001 to City of Los Angeles, Los Angeles County, California – http://www.epa.gov/region09/water/groundwater/uic-pdfs/sob-la-bioslurry.pdf; and
   - oil and gas drilling operations in the Gulf of Mexico – http://www.onepetro.org/mslib/servlet/onepetropreview?id=00013472&soc=SPE&speAppNameCookie=ONEPETRO.

   Without providing persuasive evidence to carry its burden of proof that a 10 year injection permit is necessary and in the "public interest" – as required by §342D-6 I of Hawaii's Water Pollution Control Law and Article XI of the Hawaii State Constitution, a 10 year permit cannot lawfully be granted. Nor has the County shown that the requested permit would be consistent with all applicable water quality criteria and standards and would meet the conditions for granting a permit under the applicable underground injection control (UIC) rules.

10. It is indisputable now that nitrogen-bearing wastewater effluents from the Lahaina (and Kahului) injection wells do not stay in the wells but are released from the wells and flow underground into the ocean. This has been admitted on the record by current and former County personnel (Dave Taylor and Alan Arakawa).

a. Mr. Dave Taylor, Division Chief, Wastewater Reclamation Division, County of Maui, has acknowledged on the record in an EPA public hearing on the Lahaina treatment plant's request for a ten year underground injection operating permit under the Safe Drinking Water Act that the injected waste waters do reach the ocean: "The other water, about four million gallons,
The injection well water is – does not go through the ultraviolet treatment. It goes down these deep pipes into the ground, they go down a couple hundred feet. And that water moves outward through the ground, eventually it comes out into the ocean." – Testimony of November 6, 2008, "EPA Public Hearing on Lahaina Waste Water Injection Permit," p. 8, lines 15-21.
http://www.epa.gov/region09/water/groundwater/uic-pdfs/Lahaina/1345E.pdf

b. This was not an isolated comment. Later in that same hearing, Mr. Taylor confirmed that the injection well wastewaters make their way into the ocean:

"MR. JOHN SEEBART: Hi. My name is John Seebart. I just have two quick questions for Mr. Taylor. One is, how long at the Honokowai injection plant does it take for the water to get from the plant into the water?
"MR. TAYLOR: No one is exactly sure. There – there has been a recent study in Kihei that the USGS did that showed that it took about two to five years for the water from the injection wells to reach the ocean. And our guess is because the – the geometry is kind of about the same. They're about the same depth. The water has about the same specific gravity. It floats upward. We would guess it would be similar. . . ." EPA Hearing, Nov. 6, 2008, page 13, lines 10-25 –
http://www.epa.gov/region09/water/groundwater/uic-pdfs/Lahaina/1345E.pdf

c. Alan Arkawa, former Mayor of Maui who worked at the Lahaina wastewater treatment plant and who headed up the Kahului plant similarly testified:

"When you look at the Lahaina Treatment Plant and the Kahului Treatment Plant, the effluent is very close, the wells are very close to the ocean. They are not miles above the ocean; they're hundreds of yards above the ocean. ["1500-1900 feet from the shoreline of West Maui" in Lahaina according to EPA's Statement of Basis for the proposed permit at p. 2 – http://www.epa.gov/region09/water/groundwater/uic-pdfs/Lahaina-renewal-SOB-final.pdf]. And I think that you will find that the water that's going from the treatment plant, going into the ocean, is probably getting there a lot sooner than most people think. . . . I know that, in Kahului, the water goes into the injection well, it comes out almost immediately at the ocean side. We can even see traces of it bubbling up almost as a stream. In Lahaina, we're not much further." (p. 81, lines 5-9, lines 15-19.
http://www.epa.gov/region09/water/groundwater/uic-pdfs/Lahaina/1345E.pdf

d. Maui County's official web site acknowledges the existence of "independent studies [which] detected injection well discharge in some areas of algae blooms . . ." – http://www.co.maui.hi.us/FAQ.asp?QID=473, answer to question 10.

11. It is not accidental that the nutrient-laden waste waters placed in the injection wells at the Lahaina wastewater treatment plant end up in the ocean. It is clearly by design that the injected wastes will not be contained in the wells, but will instead be released into the environment – as indicated by the data contained in the permit application itself.

a. That is the intent – how the injection well system is supposed to work. This evident from Mr. Taylor's testimony. He acknowledged discharges of "about 4 million gallons" of wastewater per day (EPA Hearing, Nov. 6, 2008, p. 8. Line 7). The record also shows "total well depth" of only "185 to 255 feet below ground surface" (Id, p. 23, lines 23-24). Diameters of the well are less than 2 feet across. See Maui County permit application (2004), Attachment M --. http://www.epa.gov/region09/water/groundwater/uic-pdfs/LahainaPermitApp.pdf. The permit application also makes clear that solid casing of these wells does not extend more than 108 feet down. Id. Given these facts alone, it is clear that these injection wells do not have anywhere near the capacity to contain the injected effluent the almost 1.5 billion gallons of wastewater effluent injected annually.

b. Moreover, the drawings of the injection wells submitted by the County with its permit application do not show any closure, seal or other barrier at the bottom of the wells. Instead, at the bottom, there is either an "open hole" or "perforated pipe". Id, Attachment Q, p. 131.

c. If further proof is needed that the wells are designed to release effluent to underground waters, geological "fractures", and seeps, see the July 2004 report (#18) on the Lahaina injection wells, where the County acknowledges that the capacity of one of the wells is "about six times greater than the daily plant flows" " (p. 16) and "over ten times the daily average flow" for another well (p. 30). http://www.epa.gov/region09/water/groundwater/uic-pdfs/LahainaPermitApp.pdf, pp. 102, 116.

d. If the first of these wells were meant to contain (not discharge) the effluent, it would only be able to do so for six days; if the second of these wells were meant to prevent (instead of facilitate) environmental discharge, it could not do so for more than 11 or 12 days. It is clear, therefore, that the design of the injection wells is to discharge the effluent, to be released underground into the environment.

12. The hydro-geology of the area and the relative density of the effluent compared to the groundwater and seawater demonstrate that the nitrogen-laden effluent flows out of the wells and into the nearby ocean.

a. Maui's lava-based geology results in the ground being porous. The injected wastewaters seep from the wells onto the surface, enter sub-surface ground water flows, and in other ways leak into the near shore ocean environment.

b. EPA's Statement of Basis for the proposed revised permit includes the following information: "The geology into which treated effluent is injected consists of highly permeable basalt lava flows. Some of the lava rock formation above the injected effluent may be less permeable, but can be fractured. Injection of treated wastewater effluent at the wells is expected to form a plume within the aquifer, extending from the wells to the coast. TDS at 180 feet was reported as 32,228 mg/l, similar to sea water. The injected effluent has a TDS of approximately 900 to 1500 mg/l. Because the injected effluent is less dense than the receiving water in the aquifer, the effluent plume will rise buoyantly. The plume will have a tendency to float up toward the basal aquifer of lesser TDS. However, while these plume migration scenarios are our understanding of the hydrology in the area, the precise path and movement of the plume has not been conclusively determined." http://www.epa.gov/region09/water/groundwater/uic-pdfs/lahaina/Lahaina-stmt-of-basis.pdf, p. 3.

c. That the flow of the effluent is generally from mountain to ocean and is not impeded by significant geological barriers is clear from a number of other sources. See the USGS information for this area, which states, "The general movement of fresh ground water in the Lahaina District is from the dike-impounded water body into the freshwater-lens system and then to the ocean." http://hi.water.usgs.gov/lahaina/lahaina_tab.htm.

d. See also, for example, the 1991 consultant's report on closure of the Olawalu Landfill, which includes the statement: "Regional hydro-geological characteristics show groundwater flow to be from the mountain foothills toward the ocean." http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Maui/1990s/1991-08-08-MA-FEA-OLOWALU-LANDFILL-CLOSURE.pdf; and

e. The 1983 "Revised EIS for the Honakahua Well B" also makes clear that the groundwater in this area tends to move unimpeded by geological barriers toward the sea:

> "Unfortunate, Sectors A and B are not bound by a continuous wedge of caprock sediments along the coast that would act to retard groundwater discharge to the sea . . . A substantial flow of groundwater continues to leak to the sea in both sectors." (pp. II-12, II-14, and II-19 computing the flow balances outward from groundwater to the sea in both sectors). http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Maui/1980s/1983-04-MA-REIS-LAHAINA-HONOKAHUA-WELL-B.pdf

e. Page 1 of the County's July 2004 Status Report (#18) on the Lahaina injection wells admits that the layers of Wailuku Basalt lava into which the effluent is

injected are "fractured." -- http://www.epa.gov/region09/water/groundwater/uic-pdfs/LahainaPermitApp.pdf, p. 87.

f. "The water that comes from that plant in Lahaina exits very, very closely nearby, within half a mile of Kahekili." (EPA Hearing, Nov. 6, 2008, p. 59, lines 4-6). The wells are only "1500-1900 feet from the shoreline of West Maui" in Lahaina according to EPA's Statement of Basis for the proposed permit at p. 2 – http://www.epa.gov/region09/water/groundwater/uic-pdfs/Lahaina-renewal-SOB-final.pdf. See also testimony of Alan Arakawa above at paragraph 4c above.

13. Very high volumes of inadequately treated wastewater effluent are currently injected into the Lahaina wells.

a. Current levels of nitrogen injection can be as high as 12,000 lbs per month of total nitrogen (or on calendar quarter basis up to 126,000 lbs/year). http://www.epa.gov/region09/water/groundwater/uic-pdfs/lahaina/Lahaina-revised-draft-permit.pdf, p. 8. Even assuming that no higher levels were discharged into the environment over the last 14 years of operation, this could still mean as much as 1.7 million lbs of nitrogen discharged over this period.

b. Under the proposed EPA revised permit, over 800,000 lbs of additional nitrogen could allowably be placed in these wells and flow into the ocean over the life of this permit.

14. Contrary to the Maui Environmental Management Department's unsubstantiated contention, there is ample scientific basis for public concern about the impact of continued release of nitrogen into deep wells as a major contributor to algal blooms that are harmful to Maui's coral reefs.

In a submission for the record dated June 23, 2009, the Environmental Management Department of Maui County asserted the following: "We are aware that individual members of the general public continue to blame wastewater effluent injection wells for algae blooms and other issues. The best scientific evidence indicates that this is not the case and that the conditions in of this [proposed] permit are not justified. Efforts at environmental protection should be based on scientific data and methodology; not on fears that cannot be justified."

We in the DIRE Coalition agree with the final sentence of this paragraph, but we cannot agree with the first two sentences. Here is why.

a. First, and perhaps most tellingly, we note that the Environmental Management Department's letter to EPA does not cite a single scientific study, report, or data source to support the position that the injection wells cannot contribute significantly to harm to the reefs.

b. Second, we note that the Environmental Management Department mischaracterizes who has expressed concern and what the scientific basis is for the expression of that concern. The June 23, 2009 letter refers only to "individual members of the general public" and does recognize the concerns expressed by the following authorities and scientific reports: The National Academy of Sciences, Hawaii DLNR's Division of Aquatic Resources, Science Magazine and the scientists listed in the Pandolfi article in 2005, a number of scientists from EPA, and the University of Hawaii, and the algae biologists working group that has been advising the County on this question. See the sources and citations in Appendix 1 of these comments. These studies, reports, and concerns are not even acknowledged by the Waste Management Division, let alone rebutted in any way.

c. Specifically, here is what EPA says on this topic: ""Deep well injection could also pose a risk to marine ecology if contaminants can readily migrate and discharge to offshore waters. . . . Two potential ecological effects of particular concern, should surface or ocean waters be sufficiently contaminated, include harmful algal blooms and bio-concentration of toxic contaminants in the food web. Algal blooms can cause a variety of toxic symptoms in aquatic organisms (including death) as well as nontoxic adverse effects such as clogging of gills and smothering of coral reefs and seagrass beds." EPA, "Underground Injection Control Program—Relative Risk Assessment of Management Options for Treated Wastewater in South Florida; Notice of Availability," May 5, 2003, p. 23673, 23677 – http://bulk.resource.org/gpo.gov/register/2003/2003_23677.pdf,

d. It is also worth noting, as does the 2005 Wastewater Reuse Report, that: "A minor challenge reported by the Kaanapali Golf Course superintendent is that during periods of extended rainfall, the greens that are irrigated with the R-1 water develop a blue-green algae film faster than the greens irrigated with brackish water." (p. 46) This tends to show that even more highly treated water than is now recycled from the Lahaina plant has the capacity to promote the growth of algae. – http://hawaii.gov/dlnr/cwrm/publishedreports/PR200502.pdf

DIRE Coalition has never claimed that the County's injection wells are solely and completely responsible for growth or algae or the harm to coral reefs that have occurred or are likely to occur in the future without major changes in our practices and behavior. We recognize that there are other significant contributing factors. But, these injection wells clearly are significant contributors to the ocean burden of nitrogen, the resultant growth in algae, and the harm that is occurring to coral reefs. And, as the National Academy of Sciences has recommended, " [These kind of wastewater management] problems [in urban coastal areas] should be tackled in a stepwise, incremental fashion, beginning with those that are of greatest importance as well as those that are easily solved, and then moving on to the next set of concerns." See 1993 NAS Report, citation #1 in Appendix 1 (below), p. 15.

15. **In light of the known threat to the reefs posed by the contributions of the Maui injection wells, the Mayor's stated goal of going to 100% wastewater reuse and ending reliance on injection wells, and the track record of 1900 other communities throughout the United States in reclaiming and beneficially reusing appropriately treated wastewater effluent on land safely, and the overwhelming opposition of the public to another ten year injection permit, the EPA should only allow a UIC permit renewal at Lahaina only for the time necessary to do the design studies, raise the funds and construct the facilities necessary to reclaim and recycle these wastewaters.** This is likely no more than five years, perhaps less. We invite the County to demonstrate otherwise.

II. Maui County's Lahaina injection wells are clearly discharging pollutants indirectly to the ocean through the injection wells and are doing so without an NPDES permit under the Clean Water Act. Thus, the County's injection well is in violation of that Act. EPA should not as a matter of policy (and legally may not) grant a UIC permit that authorizes behavior that violates the Clean Water Act.

1. Plainly, Maui County's Lahaina wastewater treatment plant has neither requested nor obtained (and is operating without) a federal or State Clean Water Act NPDES permit.

2. It is clear from the information provided above in I.5-8 that the injection wells are releasing wastewater effluent with significant nitrogen pollution that flows into the ocean.

3. The federal Clean Water Act "prohibits "the discharge of any pollutant by any person" to waters of the United States unless done in compliance with some provision of the Act. 33 USC 1342 (a). ". . Generally speaking, the NPDES requires dischargers to obtain permits that place limits on the type and quantity of pollutants that can be released into the Nation's waters." South Florida Water Management District *v.* Miccosukee Tribe of Indians et al., 541 U.S. 95 (2004) – http://supreme.justia.com/us/541/02-626/case.html

4. The federal CWA defines the term "navigable waters" to mean "waters of the United States, including the territorial seas." See: "DOH, EPA Take Action Against Pflueger on Kauai," June 2002 – http://healthuser.hawaii.gov/health/about/pr/2002/02-33epa.html, and "Cabrillo Point Liquefied Natural Gas Facility: EPA Permit for Water Discharges (2006)," in which EPA states, "The Clean Water Act ("CWA") requires that sources of water pollution obtain a [NPDES] permit prior to discharging pollutants into the Pacific Ocean." (p. 1) – http://www.coastaladvocates.com/pdf/CCPN%20EDC%20Water%20Quality%20Permit%20&%20Info.pdf. See also Craig and Miller, "OCEAN DISCHARGE CRITERIA AND MARINE PROTECTED AREAS: OCEAN WATER QUALITY PROTECTION UNDER THE CLEAN WATER ACT," which includes the following: "EPA's NPDES permitting authority extends to all waters that the Act covers, whether internal, coastal, or oceanic." (at nt. 112) – http://www.bc.edu/bc_org/avp/law/lwsch/journals/bcealr/29_1/01_TXT.htm, and see: "The Clean Water Act (CWA) requires that all discharges of pollutants to surface

waters (streams, rivers, lakes, bays, and *oceans*) [emphasis added] must be authorized by a permit issued under the National Pollutant Discharge Elimination System (NPDES) program. . . . Discharges into territorial seas, contiguous zones, and the oceans must undergo **an additional level of review** to ensure that they do not cause unreasonable degradation of the marine environment. The review is based on the EPA's ocean discharge criteria regulations codified in the Code of Federal Regulations (CFR) at Subpart M of 40 CFR Part 125." – http://web.ead.anl.gov/dwm/regs/federal/epa/index.cfm

5. It does not matter for Clean Water Act jurisdictional purposes that the treatment plant does not originate, generate or introduce the pollutants that it discharges. "We therefore reject the District's proposed reading of the definition of 'discharge of a pollutant' " contained in §1362(12). That definition includes within its reach point sources that do not themselves generate pollutants." South Florida Water Management District v. Miccosukee Tribe of Indians et.al. (2004) cited above. Likewise, The National Park Service has recognized that a Class V waste water injection well, such as the one at Lahaina, could also be subject to an NPDES requirement if the well "discharges wastewater to 'waters of the United States'" – See http://www.concessions.nps.gov/document/EnviroCheckSheet-WastewaterManagement.pdf.

6. Because the Lahaina municipal wastewater treatment plant discharges pollutants (nitrogen-containing compounds) into its injection wells and the injection wells release these pollutants into the ground or ground waters where they make their way in accordance with the hydrogeology of the area into the ocean only 1500-1900 feet away, the question arises whether the discharge of a pollutant *indirectly* into the ocean (rather than directly) exempts the plant from meeting NPDES requirements that clearly would be applicable if it dumped the wastewaters directly into the ocean.

(a) A number of courts have held that the NPDES permit requirements of the Clean Water Act clearly would or do apply even to the indirect discharge of a pollutant into navigable waters where there is "a connection or link between discharged pollutants and their addition to navigable waters."

(b) See, for example: Sierra Club v. El Paso Gold Mines, Inc., 421 F.3d 1133 (10th Cir. 2005) at paragraph 52 – http://cases.justia.com/us-court-of-appeals/F3/421/1133/609105; and Quivera Mining Co. v. USEPA, 765 F.2d 126 (10th Cir. 1985), which held, among other things, that the discharge of mine wastes to non-navigable in fact waters and arroyos would be subject to NPDES permit requirements where "the waters of the Arroyo del Puerto and the San Mateo Creek soak into the earth's surface, become part of the underground aquifers, and after a lengthy period, perhaps centuries, the underground water moves toward eventual discharge at Horace Springs or the Rio San Jose." – paragraph 10 – http://cases.justia.com/us-court-of-appeals/F2/765/126/414750. This case is noteworthy in the context of the Lahaina wastewater injection well question, in which the estimated time for the wastewaters placed in the injection wells to reach ocean is much shorter, not "centuries."

7. In the recent US Supreme Court decision in Rapanos *v.* US, 547 US __, 126 S.Ct. 2208 (2006), the US Supreme Court split 4-1-4 on the question of whether

and under what circumstances unpermitted dredging or filling of an area not directly connected to navigable waters of the United States is prohibited by the Clean Water Act. Justice Kennedy's concurring opinion held that "mere hydrological connection should not suffice in all cases" to establish Clean Water Act jurisdiction and that the required "nexus" between the discharge and receiving waters must be "significant" in order for the Clean Water Act to apply. (Two US Courts of Appeal have agreed that Justice Kennedy's opinion is the controlling one under these circumstances. [more to come – see: Levy, "Plurality Opinions," *National Law Journal*, Feb. 12, 2007 – http://www.kilpatrickstockton.com/publications/downloads/MarkLevy.pdf -- citing the 9th and 7th Circuit Courts of Appeals decisions in Northern California River Watch v. City of Healdsburg, 457 F.3d 1023, 1025 (9th Cir. 2006) and U.S. v. Gerke Excavating Inc., 464 F.3d 723, 724-25 (7th Cir. 2006).

8. Since the Rapanos decision, the US Circuit Court of Appeals for the 9th Circuit has considered the applicability of the "significant nexus" to circumstances quite similar to those presented by the Lahaina wastewater injection well discharges. That case – Northern California River Watch v. City of Healdsburg, 457 F.3d 1023, 496 F.3d 993 (9th Cir. 2007) – involved a situation in which the City of Healdsburg, CA owned and operated a municipal waste treatment plant, discharged treated waters to a nearby pond, which then percolated into an aquifer, which in turn released the wastewater effluent into the Russian River. Plaintiffs alleged that this violated the Clean Water Act, because the city had not obtained an NPDES permit for these discharges. The Court held that these circumstances met Justice Kennedy's "significant nexus" test under the US Supreme Court's Rapanos decision. The 9th Circuit Court explained, "In light of Rapanos, we conclude that Basalt Pond possesses such a "significant nexus" to waters that are navigable in fact, not only because the Pond waters seep into the navigable Russian River, but also because they significantly affect the physical, biological, and chemical integrity of the River. We affirm the district court's holding that Basalt Pond is subject to the CWA. We also affirm the district court's ruling that neither the waste treatment system nor the excavation operation exceptions in the Act apply to Healdsburg's discharges." (For reasons explained in the Northern California River Watch case, the "sewage treatment" exemption would not apply to injected wastewaters that then are released to the environment. It is intended only for elements of closed systems, according to the 9th Circuit Court of Appeals.)

9. Taken together, the high volume release of nitrogen-laden effluent from Lahaina injection wells to the ocean nearby, the proximity of the receiving waters to the injection wells, the contribution of those releases to the serious degradation of the near shore reefs, the County's knowledge that those releases are entering the ocean and the State's water pollution policy objectives of protecting reefs – these things persuasively demonstrate the existence of a "significant nexus" under the Clean Water Act between the injection well releases and the receiving waters of the United States under the Rapanos and Northern California River Watch standard.

10. The provisions of Hawai'i Administrative Rules, Title 11, regulating various aspects of water quality and [water] pollution, and Chapter 342, HRS," including "Chapter 11-55, Water pollution Control" are relevant to Justice Kennedy's

"substantial nexus" test in Rapanos, because they define with considerable specificity the state policy and purpose underlying the applicable laws, regulations, and permit conditions for the ocean waters impacted by discharges from the Lahaina injection wells. These rules provide in pertinent part:

(i) "11-55-02. General policy of Water pollution control. (a) It is the public policy of this State: (2) To protect, maintain, *and improve* the quality of state waters: . . . (B) For the growth, support, propagation of shellfish, fish, and other desirable species of marine and aquatic life . . . [and] (D) for the *coral reefs* . .... . (3) To provide that no waste be discharged into any state waters without first being given the degree of treatment necessary to protect the legitimate beneficial uses of the waters; (4) *To provide for the prevention, abatement, and control of new and existing water pollution*" [emphasis added]. http://gen.doh.hawaii.gov/sites/har/AdmRules1/11-55.pdf, pp. 55-14 – 55-15.

These Hawaii state regulations and public policy make clear the intention to "improve the quality of state waters," to protect "coral reefs" and prohibit "discharges into state waters without first being given the degree of treatment necessary to protect the legitimate beneficial uses of the waters." Yet clearly the injection of the wastewaters at Lahaina degrade the quality of state waters, endanger the reefs, and threaten legitimate recreational and economic uses of the state's near shore waters. Under these circumstances, EPA should insist on the County obtaining the necessary NPDES permit and controls to ensure consistency with Hawaii's public policy and regulations as well as the Clean Water Act's requirements.

11. Because the injection wells release nitrogen-laden pollution into the ocean in violation of these state policies, rules, and constitutional mandates, the "nexus" between the effluent release from the injection wells and the receiving waters of the US is very clearly "significant" within the meaning of Judge Kennedy's opinion in Rapanos and the Ninth Circuit Court of Appeals decision in the Northern California River Watch v. Healdsburg.

12. It follows then that Maui County's Lahaina injection wells are currently discharging pollutants to waters of the US without an NPDES permit and are thus operating in violation of the Clean Water Act. The County should, therefore, be required to obtain an NPDES permit under that Act for the Lahaina wastewater injection wells.

III.

As a matter of wisdom and law, EPA should not (and may not) grant permission under the UIC program to authorize behavior which is prohibited by another statute that the Agency is charged with administering (in this case the Clean Water Act's prohibition of pollutant discharges to the ocean without an NPDES permit). The Safe Drinking Water Act clearly does not authorize EPA to grant a UIC permit that would allow behavior prohibited by the Clean Water Act. Nor does the SDWA authorize EPA to permit violations of the constitution, water pollution policy, and

water classifications of the State of Hawaii. Thus, EPA should not grant this UIC permit application even for less than 10 year term, until the County agrees to a compliance schedule to stop its indirect discharges to the ocean without an NPDES permit under the Clean Water Act.

EPA should not turn a deaf ear and a blind eye to what it has learned in the course of this proceeding. Instead, the Agency should withhold any UIC permit extension until and unless the County agrees to eliminate this violation by obtaining, and does obtain, a valid Clean Water Act NPDES permit for its indirect discharges to the ocean in Lahaina. To do otherwise would read the Safe Drinking Water Act as authorizing violations of the Clean Water Act, and clearly there is no basis for interpreting the SDWA this way. Similarly, see National Cotton Council of America v. USEPA, - F.3d – (2009), where the court held the mere fact that a group of pesticides were registered under FIFRA could not be used as a basis for exempting the discharge of these pollutants from NPDES permitting under the Clean Water Act. "The Clean Water Act is not ambiguous." http://www.ca6.uscourts.gov/opinions.pdf/09a0004p-06.pdf

40 CFR 144.4 contains a list of federal laws administered by other federal agencies and departments that "may apply to the issuance of permits" under the UIC program. This provision indicates that "When the applicable law requires consideration or adoption of particular permit conditions or requires the denial of a permit, those requirements also must be followed." There is no suggestion in section 144.4 that the list is "exclusive" or "exhaustive." Nor would there be any reason for EPA to require itself to allow the statutes that it administers – such as the Clean Water Act – to apply to the UIC program as appropriate. Any contrary result would lead to an absurd conclusion – that EPA wanted to agree (and require the delegated states) to follow the requirements of other laws in administering the UIC program, but did not intend itself to follow the requirements of the Clean Water Act or RCRA in administering the UIC program.

Thus plainly, other statutes, too, including the Clean Water Act may require "adoption of particular permit conditions or . . . the denial of a permit" under the UIC program. Such is the case here.

IV

The County of Maui has failed to comply with Section 401 of the Clean Water Act, and thus EPA may not grant the requested UIC permit until the County complies. Section 401 requires "any applicant for a Federal license or permit to conduct any activity . . . which *may result* in any discharge into the navigable water[s]", as a condition precedent to obtaining that license or permit to "provide the licensing or permitting agency a certification from the State in which the discharge originates" that sets forth "any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with [§§1311, 1312, 1316, and 1317] and with any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section." §1341(d). [emphasis added]

In the instant situation, the County of Maui has not presented EPA Regional Director with a certification from the State of Hawaii that the proposed permit incorporates all necessary "effluent limitations and other limitations and monitoring requirements" to ensure compliance with the Clean Water Act and with State Constitutional, statutory and regulatory requirements for "water pollution prevention, abatement, and control" and for protection of the water quality values and uses in HAR 11 -54 and 11-55-02. The requested UIC permit is a "Federal license or permit" within the meaning of section 401 of the Clean Water Act. The activity to be authorized – continued injection of inadequately treated wastewater into wells that release nitrogen compounds and pathogens to the ocean – clearly "may result in a discharge into navigable waters" (albeit an indirect one). The section 401 Clean Water Certification requirements apply even to federal permits that may be issued by EPA. See 40 CFR 124.53 – State Certification – (a), which provides: "(a) Under CWA section 401(a)(1), EPA may not issue a permit until a certification is granted or waived in accordance with that section by the State in which the discharge originates or will originate." http://cclme.org/viewcontents/?f=1-40CFR124.txt&o=1.

The State of Hawai'i has adopted state water quality standards which could be threatened or violated by these discharges. See Appendix 1 re relevant Hawai'i constitutional standards and requirements and HAR 11-54 and 11-55 for the state's water quality standards and pollution control requirements. http://gen.doh.hawaii.gov/sites/har/AdmRules1/11-54.pdf, and http://gen.doh.hawaii.gov/sites/har/AdmRules1/11-55.pdf.

Under section 510 of the Clean Water Act, "States may develop water quality standards more stringent than required by the Water Quality Standards Regulation." EPA, *NPDES Permit Writers' Guide* (1996), pp. 13, See also pp 87-88: "Permit writers must consider the impact of every proposed surface water discharge on the quality of the receiving water. Water quality goals for a water body are defined by State water quality standards. A permit writer may find, by analyzing the effect of a discharge on the receiving water, that technology-based permit limits are not sufficiently stringent to meet these water quality standards. In such cases, the CWA and EPA regulations require development of more stringent, water quality-based effluent limits (WQBEL) designed to ensure that water quality standards are met.
"http://www.mcelroylaw.com/US%20EPA%20NPDES%20Permit%20Writers%20Guide%201996.pdf

In the absence of the required state certification and the incorporation of the necessary effluent limits and other limitations as conditions of the permit, section 401 of the Clean Water Act and EPA regulations at 40 CFR 124.53(a) prohibit EPA from issuing the requested UIC "permit" or any NPDES permit. See S. D. Warren Co. v. Maine Board of Environmental Protection et al., 547 US __, 126 S. Ct. 1843 (2006) -- http://www.supremecourtus.gov/opinions/05pdf/04-1527.pdf; and PUD No. 1 of Jefferson City. V. Washington Dept. of Ecology, 511 U. S. 700 (1994).

V

Recommended Conditions for Any UIC Permit to Be Granted: Here are the specific recommendations that flow from what we have said above.

1. EPA should not grant any UIC permit for Lahaina in excess of five years in duration.
2. EPA should set stringent controls on allowable nitrogen and phosphorous levels, and should require more effective disinfection of pathogens than would be required by the proposed revised permit. These treatment upgrade requirements are necessary to protect public health, recreational and economic uses of the ocean, and the health of the coral reefs and associated ocean ecosystem. We specifically endorse the recommendations contained in the testimony of Robin Knox in this regard.
3. As a condition of any UIC permit for Lahaina, EPA should require effective monitoring of ground and ocean water quality and bio-impact (including regular reporting on algal growth and coral reef degradation, and require prompt public reporting of all monitoring results);
4. Any permit UIC permit should required that by no later than January 1, 2011, the County of M develop and publish a detailed plan with benchmarks of progress for design, financing, construction and operation of necessary treatment upgrade and wastewater reuse facilities, which plan shall provide for ending wastewater injection by no later than January 1, 2015.
5. Any UIC permit should include conditions requiring the County as expeditiously as possible to curtail violations of the Clean Water Act and agree to an enforceable schedule for obtaining an NPDES permit for discharges to the ocean from the County's injection wells (at Lahaina, Kahului, Kihei, and Kaunakakai)
6. EPA should grant the Lahaina permit described above only after the State has provided the certification required by section 401 of the Clean Water Act, including the effluent limitations and other requirements necessary to ensure compliance with all applicable State constitutional and regulatory policies and requirements. These too should be added as conditions to any permit EPA may grant.

Finally, the DIRE Coalition requests that in any final decision on the Lahaina permit, the Agency – in keeping with its regulations and its commitment to transparency – to make findings of fact and conclusions of law, to full explain its position, and to address the major issues and concerns raised in these comments and in the comments of others who have opposed the proposed revised permit. (The Agency did not provide an adequate response to the earlier hearing in its statement of basis for the proposed revised permit, although we were pleased with some of the improvements in the revised permit over that initially proposed. For example, the Agency did not address the question of burden of proof, why it proposed to permit 10 more years of injection when this was unanimously opposed by all those at the public hearing, the applicability of NPDES permit requirements to the ocean discharges from the injection wells, the relevance of state constitutional and regulatory water-related mandates to the County's petition, and other issues and concerns raised in our earlier testimony.) We hope and expect that in the final decision the Agency will explain with some specificity how it arrived at its decision and what weight it gave to various information, policy concerns, and views it receives on this proposed revised permit.

Appendix 1 –
Scientific Basis for Concern about Impact of Release of Nitrogen
From Lahaina Wastewater Injection Wells on Coral Reefs in Maui

Below find the scientific articles, publications, reports, and statements that give rise to the concerns of the DIRE Coalition about the adverse impact of nitrogen releases to the ocean through County wastewater injection wells in the vicinity of Lahaina, Maui on coral reefs and ocean ecosystems nearby. This Appendix also provides citations to and excerpts from select scientific reports expressing concerns about the health threats from pathogens in wastewater effluent, whether discharged to oceans or reused on land without prior appropriate levels of treatment/disinfection:

1. **National Academy of Sciences, Managing Wastewater in Coastal Urban Areas, (1993) – http://books.nap.edu/openbook.php?record_id=2049&page=1:**

"Among the myriad of factors that affect coastal environmental quality, the management of wastewater and stormwater are perhaps the two most critical considerations. Without appropriate control measures, these activities have the potential to wreak serious harm on the coastal environment." (p. 23)

"In general, a wastewater constituent may be considered to be of high concern if it poses significant risk to human health or ecosystems well beyond points of discharge and is not under demonstrable control." (p. 4)

(a) Concerns re addition of nitrogen to marine coastal waters

"Finding: Nutrient enrichment, primarily due to nitrogen, is an important problem in many estuarine and some coastal marine systems.

"Nutrients: Nitrogen – Associated Impacts in the Marine Environment: Excessive levels of nutrients increase primary production. At adverse levels, impacts include nuisance algal blooms, dieback of coral and seagrasses, and local- and regional-scale eutrophication. Eutrophication can lead to hypoxia and anoxia, which suffocate living resources." (p. 24)

"In the collective judgment of the Committee, in general, a wastewater constituent may be considered to be of high concern if it poses significant risk to human health or ecosystems (e.g., if it contaminates fish, shellfish and wildlife, causes eutrophication, or otherwise damages marine plant and animal communities) well beyond points of discharge and is not under demonstrable control." (pp. 26-27). The NAS report then lists "nitrogen" as a "High Priority Constituent of Concern." (p. 27)

Recommendation: *Greater attention should be focused on preventing excess regional enrichment of nitrogen and other nutrients at levels that are harmful to ecosystems."* (p.8)

"Recommendation: *Source control of pollutants should be strongly encouraged by incentives and regulation."* (p.9)

". . . wastewater treatment, sludge disposal practices, and other management controls should be guided by water and sediment quality requirements of the receiving waters." (p. 10)

"Through the continuing [Integrated Coastal Management] process, problems should be tackled in a stepwise, incremental fashion, beginning with those that are of greatest importance as well as those that are easily solved, and then moving on to the next set of concerns." (p. 15)

(b) Concerns re pathogens in wastewater effluent discharges

"Pathogens" are also listed in the report as a "High Priority Constituent of Concern. " (p. 27) "Pathogens are microorganisms that can cause disease in humans and are found in wastewater, stormwater, and urban runoff. They include bacteria, viruses and protozoa, and are most often associated with gastrointestinal illnesses and hepatitis. Individuals can be exposed to these organisms through contact with contaminated recreational water and consumption of contaminated shellfish." (p. 26)

"Recommendation: The EPA, public health agencies, and wastewater treatment agencies should vigorously pursue the development and implementation of techniques appropriate for routine monitoring to measure more directly the presence of pathogens, particularly in marine and estuarine waters." (p. 12)

2. **Goreau & Thacker, "Coral Reefs, Sewage, and Water Quality Standards," Caribbean Water And Wastewater Association Conference (1994) -- http://www.globalcoral.org/CORAL%20REEFS.%20SEWAGE,%20AND%20WATER%20QUALITY%20STANDARDS.htm**

". . . water quality standards for tropical coastal waters need to be set at or below the levels at which they are shown to damage coral reefs: in particular nutrients need to be below the level at which they stimulate massive growth of weedy algae which overgrow and kill corals. The levels of nutrients that damage reefs are around a hundred times lower than those that harm human beings, so use of human health water quality standards are deadly to coral reefs. It analyzes data on nutrient levels in Jamaican coral reefs which indicate that they are way above the ecologically acceptable water quality standards for coral reefs as established by Lapointe and Bell, and show that over fertilization by nutrients, not the lack of fishes and sea urchins, are the major reason for the almost complete replacement of corals with weedy algae. This replacement has been followed around Jamaica for 40 years, and took place at different times at each site, always following coastal development, and uncorrelated with over fishing or sea urchin mortality except coincidentally at a few places. Researchers who propose that stopping fishing will allow the reef to recover are mistaken as to the main causes of reef deterioration and are proposing remedies that cannot work: in fact the reef no longer provides habitat for fish because of habitat degradation caused by massive sewage releases to coastal waters, and only removing the nutrients before they reach the sea can allow the reefs and the fisheries to recover. Biological tertiary sewage treatment on a wide scale is needed for the water quality to be improved to a level where recovery is possible. These lessons from Jamaica also apply to virtually every populated region and tourism resort area near coral reefs."

3. **EPA, "Development of Biological Criteria for Coral Reef Ecosystem Assessment," (1998) – http://www.epa.gov/owow/oceans/coral/documents/biocrit.pdf**

"Almost half of **Hawaii's** reefs are vulnerable (Burke et al. 1998). All coral reef habitats in the main Hawaiian Islands are overfished in various degrees. Each main island in the chain is characterized by specific but localized anthropogenic induced problems that are geographically unique and most are found where water circulation is restricted. Sedimentation and eutrophication are generally the most serious problems (Grigg 1997)." (p. 13)

"Although not a bio-indicator per se, Risk *et al.* (1994) and Dunn (1995) have suggested the determination of stable isotope ratios of 15N/14N (denoted d 15N) in reef organism tissues as an excellent means of specifically evaluating the input of human fecal wastes into reef ecosystems. In studies in Zanzibar and the Maldives, tissues of reef corals from sites with heavy human sewage inputs showed significantly higher d 15N values than coral tissues from relatively "clean" sites (Risk *et al.* 1994). This technique is based upon the stepwise enrichment of 15N/14N ratios along increasing trophic levels, which is caused by the preferential elimination of the lighter isotope 14N in urine and excretion products and the resulting d 15N increase in organism tissues and feces (reviewed in Peterson and Fry 1987). The technique is further predicated on the hypothesis that coral reef trophic structures with differing levels of sewage inputs will reflect these differences in the d15N signal at each trophic level. Those reefs with minimal sewage input should exhibit relatively low d15N values at each trophic level, indicative of oligotrophic conditions where algal fixation of atmospheric N (d 15N=0 by definition) is the major source of nitrogen. Conversely, those reefs which are strongly impacted by inputs of human faecal matter should show enriched d 15N values, as a result of utilization of the relatively high d 15N fecal matter as a primary nitrogen source at the base of the trophic structure." (pp. 42-43)

4. **USEPA, *Class V Underground Injection Control Study – Vol. 7: SewageTreatment Effluent Wells* (1999), -- http://www.epa.gov/ogwdw/uic/class5/pdf/study_uic-class5_classvstudy_volume07-sewagetreatmenteffluent.pdf**

As early as 1993, reports were being received by EPA from "USGS and the State of Florida" " regarding "a study of the operation of sewage treatment effluent wells in the Florida Keys. . . . The USGS reported that the local population, the USEPA, and the National Oceanic and Atmospheric Administration (NOAA) perceive at excessive algal growth, coral diseases, and marine grass and sponge mortality are caused by release of sewage treatment effluent nutrients migrating from ground water into surface water on both sides of the Florida Keys (USGS, 1993; USGS, 1998)." (p. 79)

Viral tracers were linking the perceived damage to the sewage treatment effluent nutrients migrating from the wells. . . . These and other studies led USEPA to determine that "the geology of the Florida Keys is not suitable for the use of waste disposal wells" (USGS, 1998)." (p. 80).

"Environmental damage cases for the Hawaii UIC program involved surface seepage of injectate, resulting in contamination of surface water with injectate nutrients (i.e., nitrogen, phosphorous). If contamination is detected, the injection well should be removed from operation while the potential contamination and its source are investigated." (p. 87)

5. **Morgenstern, "Clouds Over the Coral (impact of human habitat and tourism on the coral reefs of the Florida Keys)," E Magazine (1999) – http://www.emagazine.com/view/?459**

"The primary pollutant groups are 'nutrients' (compounds of nitrogen and phosphorus that come from sewage and fertilizer), and chemical pollution (insecticides, heavy metals and other toxic chemicals in stormwater, wastewater and engine discharges). Nutrients foster the growth of algae, which use up oxygen in the water, smother coral and decrease visibility. In the Keys, the two local sources of pollution and nutrients are runoff and wastewater disposal from the islands themselves, and the water flowing out of the agricultural areas of South Florida and through the Everglades to Florida Bay. . . .

". . . despite the lively debate about which source is the major culprit of reef decline, all are targeted for elimination; the only dispute is timing."Whether land-based nutrients are reaching the reef or not is irrelevant, because there is no question that they are harming the shore waters. That alone is a good enough reason to eliminate all sources as fast as we can," says EPA's Kruczynski."

6. **Mueller, "Coral Reefs in the 21st Century: Is the Past the Key to the Future," (2000) – http://www.cotc.edu/professional/osu/faculty/jstjohn/Geology-talks/Muller-talk.htm**

Numerous factors are identified as contributing to the decline of coral reefs, including "sewage from so-called "deep-injection wells" in urban areas of southern Florida)."

7. **EPA, "Underground Injection Control Program—Relative Risk Assessment of Management Options for Treated Wastewater in South Florida; Notice of Availability," May 5, 2003, p. 23673, 23677 – http://bulk.resource.org/gpo.gov/register/2003/2003_23677.pdf:**

"Deep well injection could also pose a risk to marine ecology if contaminants can readily migrate and discharge to offshore waters. . . . Two potential ecological effects of particular concern, should surface or ocean waters be sufficiently contaminated, include harmful algal blooms and bio-concentration of toxic contaminants in the food web. Algal blooms can cause a variety of toxic symptoms in aquatic organisms (including death) as well as nontoxic adverse effects such as clogging of gills and smothering of coral reefs and seagrass beds."

8. **U. of H. Professor of Agricultural Economics, Chauncey Ching, "Testimony before US Senate Water and Power Subcommittee," 2003 – http://energy.senate.gov/hearings/testimony.cfm?id=756&wit_id=2072**

"West Maui is a good candidate for increased recycled water use primarily because most of the properties mentioned above use potable water for irrigation. Potable water sources

in the area are scarce. Frequent, prolonged droughts on Maui have contributed to this situation. *If the recycled water is not utilized, it is disposed of through injection wells. Maui County has been encouraged to reduce the use of injection wells by the EPA and local environmental groups due to concerns that injection wells contribute nutrients to the near shore environment that cause algae blooms.* The increased use of recycled water in West Maui will ease these concerns by reducing the use of injection wells for effluent disposal." [emphasis added]

9. **Gonser, "Island Reef Study Provides Insight Into Destruction," *Honolulu Advertiser*, Dec. 2, 2003 – http://the.honoluluadvertiser.com/article/2003/Dec/02/ln/ln15a.html**

"'We need to reduce the amount of nutrients going into the near-shore waters,' Hamnett said. 'We don't need to study that any more. You put nutrients in, it is going to feed algae. We need to stop taking herbivores out of system, the fish that eat the algae. We need to prevent alien species from being introduced and eradicate the ones out there now. It's not rocket science.'" Quoting Michael Hamnett, Director, Coral Reef Initiative Research Program,

10. **The Limtiaco Consulting Group, *2004 Hawaii Water Reuse Survey and Report – Final*, (2005), prepared for Hawaii Department of Lands and Natural Resources, Commission on Water Resource Management – http://hawaii.gov/dlnr/cwrm/publishedreports/PR200502.pdf.**

"Water reuse should be viewed as a key component of sustainable water resource management. Recycled water can be a drought-proof and reliable supply of water. It can replace potable water that is currently used for non-potable purposes. In some instances, the availability of recycled water has stimulated Hawaii's economic development by attracting business activity. Water reuse also provides a mechanism for nutrients in wastewater to be utilized by vegetation, thereby reducing the need for fertilization in most instances. *Finally, water reuse is recognized as an environmentally preferred method of disposing treated wastewater (effluent), when compared to the traditional disposal methods through outfalls and injection wells.* While water reuse applications have grown significantly in Hawaii in recent years, recycled water is still an underutilized resource with many opportunities for expansion." [emphasis added] (p. 7)

The initial driving factor behind the development of Maui County's water reuse program was a regulatory agency belief that Maui's effluent disposal practices were causing environmental problems. The United States EPA and local environmental groups expressed a concern that injection wells may contribute nutrients that cause algae blooms in coastal waters. In 1995, the EPA placed a limitation on the amount of effluent that could be disposed into the injection wells at the county's Lahaina Wastewater Reclamation Facility (WWRF). This factor played a major role in the passage of the bill, which led to the mandatory recycled water use ordinance on Maui. Increased recycled water use on the island and the results from scientific studies, which indicated that other non-point nutrient sources might be the cause of the periodic algae blooms, have somewhat eased this concern. Nevertheless, effluent disposal will continue to be an important factor driving the County of Maui's water reuse program since most of its wastewater reclamation facilities rely on injection wells. As performance of these

injection wells eventually decline, increasing the use of recycled water from the respective facilities rather than drilling additional wells may be required by regulatory agencies." (p. 18; see also p. 44)

11. **Smith et al, "Characterization of a large-scale ephemeral bloom of the green alga *Cladophora sericea* on the coral reefs of West Maui, Hawai'i," Marine Ecology Progress Series (2005) – http://cat.inist.fr/?aModele=afficheN&cpsidt=17299079**

"The filamentous green alga Cladophora sericea G. Hudson (Kutzing) has formed episodic and ephemeral nuisance blooms on West Maui's coral reefs over the past 2 decades. Despite a paucity of evidence, nutrient-rich runoff, groundwater seepage, and upwelling have all been suggested as the cause of these blooms. The goals of this study were to characterize a number of physical and biological variables during a bloom event that occurred during the summer of 2001. We quantified the nutrient environment (water column and sediment porewater), benthic community structure, and herbivore abundance along a depth gradient in an effort to identify factors that may influence bloom dynamics. Further nutrient enrichment and growth experiments were conducted with C. sericea in both the field and the laboratory to determine the response of this alga to enhanced nutrient concentrations. Sediment porewater sampled 0.25 m into the substrate had high concentrations of ammonium, nitrate, and silicate, and low salinity relative to overlying ambient water, suggesting groundwater intrusion was occurring into the sediment interstices. Tissue samples of C. sericea showed elevated nitrogen and $\delta^{15}N$ at shallow sites, and these values declined with depth. . . . The results of this study suggest that the bloom of C. sericea may have been influenced by land-based nutrients via groundwater seepage, but other physical factors are also likely to be involved in the development, persistence and senescence of this dynamic species."

12. **Pandolfi, et al, "Are US Coral Reefs on the Slippery Slope to Slime?" Science, March 18, 2005, pp. 1725-6 -- http://www.reefresilience.org/pdf/1725-Are_US_Reefs_on_Slippery_Slope_to_Slime.pdf**, and sources cited there.

"First, scientists should stop arguing about the relative importance of different causes of coral reef decline: overfishing, pollution, disease, and climate change. Instead, we must simultaneously reduce all threats to have any hope of reversing the decline. . . . "By contrast [to the Bahamas, Cuba, and other areas], the Florida Keys and main Hawaiian Islands are far further down the trajectory of decline." (p. 1725-6)

"For too long, single actions such as making a plan, reducing fishing or pollution, or conserving a part of the system were viewed as goals. But only combined actions addressing all these threats will achieve the ultimate goal of reversing the trajectory of decline." (p. 1726)

"We need to act now to curtail processes adversely affecting reefs. Stopping overfishing will require integrated systems of notake areas and quotas to restore key functional groups. Terrestrial runoff of nutrients, sediments, and toxins must be greatly reduced by wiser land use and coastal development. Reduction of emissions of greenhouse gases is needed to reduce coral bleaching and disease. . . . Our vision of how to reverse the decline of U.S. reefs rests on addressing all threats simultaneously." (p. 1726)

13. **Lapointe, et. al., "Macroalgal blooms on southeast Florida coral reefs: II. Cross-shelf discrimination of nitrogen sources indicates widespread assimilation of sewage nitrogen," (2005) – http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B73D7-4GV9SJC-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=975065986&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=9959b87406a0467e02d08868743d9dd4**

"Multiple lines of evidence supported the hypothesis that land-based sewage N was more important than upwelling as a N source to these HABs: (1) $\delta^{15}N$ values were highest on shallow reefs and decreased with increasing depth, indicating land-based sources of enrichment; (2) elevated $\delta^{15}N$ values occurred in these HABs during the dry season, prior to the onset of the summer upwelling; (3) elevated NH_4^+ concentrations occur on these reefs during both upwelling and non-upwelling periods and are kinetically preferred by macroalgae compared to upwelled NO_3^-. These findings provide a case study of a coupling between increasing anthropogenic activities and the development of macroalgal HABs, including invasive species that threaten economically important reef resources in southeast Florida."

14. **Hawai'i Department of Health, "Wastewater Systems," Hawaii Administrative Rules, 11-62 (2005) – http://oeqc.doh.hawaii.gov/sites/har/AdmRules1/11-62.pdf**

"11-62-01. Preamble. "The department of health seeks to ensure that the use and disposal of wastewater and wastewater sludge does not contaminate or pollute any valuable water resource, does not give rise to public nuisance, and does not become a hazard or potential hazard to the public health, safety, and welfare. . . . The department of health seeks to advance the use of recycled water and wastewater sludge consistent with public health and safety and environmental quality. The department of health acknowledges that when properly treated and used, all recycled water and wastewater sludge are valuable resources with environmental and economic benefits and can be used to conserve the State's precious resources. The director acknowledges that the most highly treated recycled water and exceptional quality wastewater sludge can be used for a wide variety of applications with the appropriate restrictions when best management practices and other requirements of this chapter are met." (pp. 62-5 and -6) See also: sections 11-62-02 et. seq.

15. **Storlazzi et al, "Human Enteric Viruses as Markers for Sources and Presence of Sewage Contamination in Coral Reefs" in *Environmental Change and Its Impact on Coral Reefs IV* (2006), -- http://www.agu.org/meetings/os06/os06-sessions/os06_OS54J.html**

"Results [in the Florida Keys] to date suggest that corals as far as 7 mi offshore are exposed to human sewage and can be documented by the presence of human-specific viruses. Furthermore, groundwater flow appears to be an important conduit for transport of these contaminants offshore."

16. **C. Hunt, "Ground-Water Nutrient Fluxes to Coastal Waters in the Kihei Area, Maui, Hawaii," Environmental Change and Its Impact on Coral Reefs IV (2006) – http://www.agu.org/meetings/os06/os06-sessions/os06_OS54J.html**

"Water sampling and numerical modeling were used to estimate ground-water nutrient loads in the Kihei area of Maui, where growth of macroalgae (seaweed) on coral reefs raises ecologic concerns and accumulation on beaches has caused odor and removal problems. Ground-water recharge was estimated to be 85,400 cubic meters per day within a 189 square-km area having a coastline length of 13 km. Another 11,400 cubic meters per day of tertiary-treated wastewater effluent is injected into the underlying aquifer at a County treatment plant midway along the coast and 1.2 km from shore. The injection plume is 1.5 km wide at the shore, as estimated from a three-dimensional ground-water model. Wastewater injected beneath the brackish ground-water lens rises buoyantly and spreads out at the top of the lens, diverting and mixing with ambient ground water. Ground water discharging from the core of the injection plume is 2-3 years old and about 60 percent effluent at the shore, according to the model. Dissolved nitrogen and phosphorus concentrations in treated effluent were 7.3 and 1.7 milligrams per liter, roughly 6 and 26 times background concentrations at an upland well. Background nitrogen and phosphorus loads carried by ground water are 7.8 and 0.45 kg/d-km (kilograms per day per kilometer of coast). Wastewater loads estimated at the injection source and distributed across the plume width are 57 and 13 kg/d-km nitrogen and phosphorus, roughly 7 and 30 times background load. Water from a downgradient well reflects nutrient degradation in an oxygen-depleted plume and provides a more conservative estimate of injection load approaching the shore: 27 and 1.5 kg/d-km nitrogen and phosphorus, roughly one-half and one-ninth the injection-source load and both roughly 3.5 times background load."

17. **Hunt, *Ground-Water Nutrient Flux to Coastal Waters and Numerical Simulation of Wastewater Injection at Kihei, Maui, Hawaii*, USGS (2006) – http://pubs.usgs.gov/sir/2006/5283/sir2006-5283.pdf, and Tanji, "Invasive algae blooms, hurts reefs," *Maui News*, May 27, 2007 – http://www.drleisure.com/MSPalgae.html**

"In a study conducted along the North Kihei coastline by researchers Celia Smith and Chip Hunt, Sparks said, research showed that a chemical tracer added to the treated effluent pumped into the ground was showing up in the offshore waters. The levels of the tracer, a nitrogen isotope, [were] elevated in the water where Hunt's model showed an injection plume would be seeping out."

18. **Parabicoli, "Maui's Growing Water Reuse Experience," Proceedings of the Water Environment Federation (2007) – http://www.ingentaconnect.com/content/wef/wefproc/2007/00002007/00000010/art00024**

"The objectives of Maui's water reuse program are to supplement Maui's limited potable water supply and to reduce the use of injection wells for effluent disposal. Recycled water is reused from all five of the County's wastewater reclamation facilities and significant

distribution systems have been constructed in south and west Maui. Recycled water is now used for a wide variety of purposes including landscape irrigation, agricultural irrigation, cooling, fire control, composting, toilet flushing, environmental enhancement and construction purposes. . . . The initial primary factor driving Maui's water reuse program was a concern that the use of injection wells for effluent disposal was the main cause of periodic seaweed blooms that occur in Maui's coastal waters. While this concern still lingers, increased development and the lack of available fresh water have shifted the primary driving factor to more of a water supply issue. Recycled water is now considered an extremely valuable resource in Maui County and as a result, developers are funding expansions to Maui County's recycled water distribution systems. These expansions will benefit Maui's community and environment through potable water savings and the reduction in the use of injection wells for effluent disposal." (pp. 7546-7564)

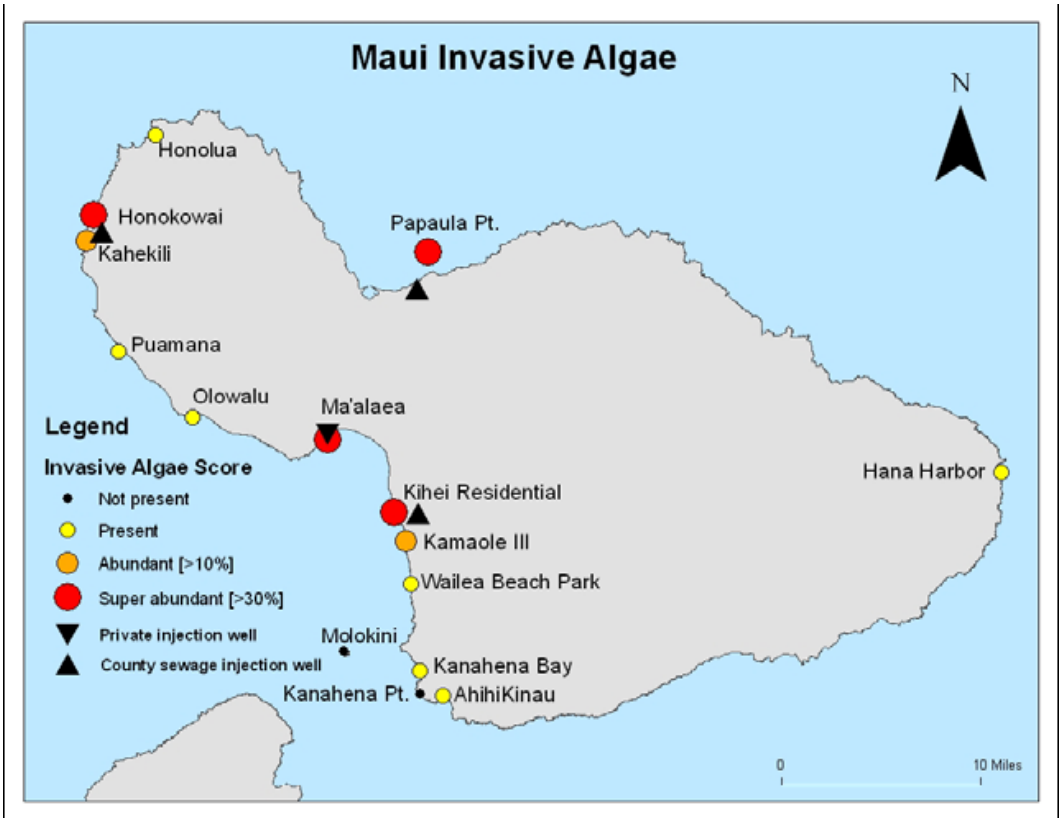
19. Williams, Sparks, and Smith, "Status of Maui's Coral Reefs," Hawaii Division of Aquatic Resources (2008) – http://hawaii.gov/dlnr/dar/pubs/MauiReefDeclines.pdf

"Mean coral cover of the 9 reefs [monitored on Maui from 1999-2006] declined from 35% when sites were first surveyed (1994 for West Maui, 1999 elsewhere) to 27% in 2006. Thus, nearly ¼ of all living coral was lost over that period." (p. 1)

"The causes of coral reef decline around Maui are complex and vary among locations, but there are strong indications that human impacts have been very important. Notably, cover has declined at several West Maui sites: Honolua Bay, Kahekili, shallow reefs of Olowalu, and at Maalaea, where anthropogenic impacts from shoreline development and human use are likely greatest. Conversely, sites which have experienced increases or sustained high coral cover are remote or offshore (Kanahena Bay and Molokini)." (p. 1)

"***The Growing Problem of Invasive Algae***
A significant and growing concern is the increasing overgrowth of reefs by invasive seaweeds, particularly *Acanthophora spicifera, Hypnea musciformis and Ulva* spp.. Shallow reefs in Kihei and Maalaea are now almost totally overgrown by those species and *A. spicifera* has become much more abundant in recent years at other locations including Honokowai/Kahekili and Papaula Point. Algal blooms are indicative of a loss of balance between factors which promote algal growth (e.g. nutrient availability) and those which control algal abundance (e.g. grazing). It is likely that both high nutrients & low grazing have been important." (p. 1)

"Studies by researchers from University of Hawaii (UH, next page), together with the evident correspondence between reefs with severe algal blooms and coastal areas with high human population density (see →), strongly suggest that elevated nutrients from wastewater or fertilizers are fueling accelerated algal growth." (p. 1)



"Recent research by UH scientists which has focused on shallow Kihei reefs which are currently overgrown by *Hypnea* and *Ulva*, strongly suggests that terrestrial, likely anthropogenic, nutrients are driving algal blooms there:
• Concentrations of nutrients (Nitrogen and Phosphorus) are highly elevated in nearshore areas where algal blooms are found. • Stable isotope ratios (δ15N ‰) in algal tissue are indicative of animal waste (presumably sewage) being their primary source.
• Growth rates of algae on shallow reefs are extraordinarily high (*Hypnea* is able to double its biomass in just 2 days). Such growth rates are so high that the estimated productivity of shallow Kihei reefs is among the highest ever recorded for any ecosystem on the planet."

"It is very important to recognize that the kind of degradation which has occurred at Maalaea and elsewhere is not just a matter of loss of coral cover. Reductions in associated habitat quality and topographical complexity mean that once degradation is well established, affected reefs will have lower recreational and commercial value, and will support limited fish stocks, to the detriment of all resource users. The goal of those charged with the protection and restoration of Hawaii's natural resources must be to prevent such severe degradation from further affecting Maui's reefs. Given the trajectories of decline over the last 7-13 years, it is evident that substantial deterioration can occur rapidly. If steps are not taken to return conditions to those in which corals can thrive, it is nearly certain that additional reefs will reach the state of Maalaea. Recovery of herbivore stocks may be part of the solution at some locations, but without other steps to reduce land-based impacts there is unlikely to be substantial recovery across the island's reefs." (p. 2)

20. Testimony of David Taylor, Wastewater Reclamation Division Chief, Department of Environmental Management, Maui County Council Land Use Committee, Aug. 24, 2007, -- www.co.maui.hi.us/archives/75/070824r_min.pdf

"Reclaimed water wasn't really on the radar in the early 1990s. So wastewater was looked at as how do we get it from the people generating the wastewater, to the plant, and get it down the injection well. But now because of issues with injection wells and reclaimed water as a source, the issues become, how do we get the reclaimed water back to where it was generated? And where we can use reclaimed water is on the outskirts of town in the large open areas. So the whole philosophy of bringing the wastewater from the external areas to the center and putting it down the wells it's not really what we're looking at anymore. Now we've shifted to how do we get the water treated and back to the edges of the community where the large tracks for reclaimed water are." (pp. 10-11)

21. Hawaii Division of Aquatic Resources, DNLR, "*State of Maui's Reefs* (2008), -- http://hawaii.gov/dlnr/dar/pubs/MauiReefDeclines.pdf

"Coral cover . . . declined at 5 reefs, most dramatically at Honolua (42% to 9%) and at Kahekili (55% to 33%). Mean coral cover of the 9 reefs declined from 35% when sites were first surveyed (1994 for West Maui, 1999 elsewhere) to 27% in 2006. Thus, nearly ¼ of all living coral was lost over that period. . . . [C]oral cover at the Maalaea site declined from 18% to 8% between 1999 and 2006."

"A significant and growing concern is the increasing overgrowth of reefs by invasive seaweeds, particularly *Acanthophora spicifera, Hypnea musciformis and Ulva* spp.. Shallow reefs in Kihei and Maalaea are now almost totally overgrown by those species and *A. spicifera* has become much more abundant in recent years at other locations including Honokowai/Kahekili and Papaula Point. Algal blooms are indicative of a loss of balance between factors which promote algal growth (e.g. nutrient availability) and those which control algal abundance (e.g. grazing). It is likely that both high nutrients & low grazing have been important." (p. 1)

"Recent research by UH scientists which has focused on shallow Kihei reefs which are currently overgrown by *Hypnea* and *Ulva*, strongly suggests that terrestrial, likely anthropogenic, nutrients are driving algal blooms there: Concentrations of nutrients (Nitrogen and Phosphorus) are highly elevated in nearshore areas where algal blooms are found. Stable isotope ratios (δ15N ‰) in algal tissue are indicative of animal waste (presumably sewage) being their primary source." (p. 2)

"It is very important to recognize that the kind of degradation which has occurred at Maalaea and elsewhere is not just a matter of loss of coral cover. Reductions in associated habitat quality and topographical complexity mean that once degradation is well established, affected reefs will have lower recreational and commercial value, and will support limited fish stocks, to the detriment of all resource users. The goal of those charged with the protection and restoration of Hawaii's natural resources must be to prevent such severe degradation from further affecting Maui's reefs. Given the trajectories of decline over the last 7-13 years, it is evident that substantial deterioration

can occur rapidly. If steps are not taken to return conditions to those in which corals can thrive, it is nearly certain that additional reefs will reach the state of Maalaea. Recovery of herbivore stocks may be part of the solution at some locations, but without other steps to reduce land-based impacts there is unlikely to be substantial recovery across the island's reefs." (p. 2)

22. Letter of Dan Polhemus, Administrator, Hawaii Department of Lands and Natural Resources, Division of Aquatic Resources, to EPA, September 22, 2008 – http://www.epa.gov/region09/water/groundwater/uic-pdfs/lahaina/SoH-DoLaNR-DoAR-DanPolhemus.pdf

". . . many of [Hawaii's] reefs [are] showing substantial decline in the percentage of living coral reef cover over the past several decades. Of particular importance to [the Lahaina injection well permit] is the evidence we have collected that reefs immediately offshore of the [Lahaina facility] are experiencing substantial degradation. . . . [O]ur agency has very serious concerns over the potential impacts of wastewater injection wells on the health of Hawaii's coral reefs. . . . "[S]everal years of coral reef monitoring data . . . clearly show that a correlation exists between wastewater injection, decreasing coral cover, and increased problems with invasive algae." (p. 1)

"The attached document 'Status of Maui's Coral Reefs' was produced based on several years of coral reef monitoring data. These data clearly show that a correlation exists between wastewater injection, decreasing coral reef cover, and increased problems with invasive algae." (pp. 1-2)

"We recognize the fact that there are numerous causes for coral reef declines, and that other land based nutrient sources (i.e., intensive agricultural, coastal resort landscaping, and urban runoff) are likely to be contributing to these recorded coral reef declines as well, but we also feel that reduction and/or elimination of wastewater injection would greatly reduce the total nutrient loads on our coral reefs." (p. 2)

"Maui must move forward with more responsible water conservation measures, including programs in wastewater reuse" (p. 2)

"We would like to see permit conditions set to encourage less wastewater injection and more reuse." (p. 3)

23. C. Smith, "Integrated Ecosystem Management: Maui." U of Hawaii/Manoa, December 2008, -- http://www.hawaii.edu/ssri/hcri/files/research/pdf/Smith-FY07-HCRI-NOAA-Final-Report.pdf

"This project is concerned with the decadal documentation that increased algal abundance results in the decline of original framework building species such as corals and crustose coralline algae on reefs along the coast of Northwest Maui. This project focuses on the potential causative role of invasive algae in driving such decline to gain insight in the

dynamics that cause algae to become abundant and developing practical approaches to restore the environmental conditions under which corals once thrived." (p. 2)

"Heavy δ15N signatures (≥18‰ orange and red circles) correspond to areas with a sewage injection a well (i.e. Kahului, Kihei and North Kaanapali) which shows that the injected reclaimed water is percolating into the near shore marine environment." (p. 8)

"Because the previous study was able to successfully detect areas of anthropogenic concern due to the presence of elevated δ15N values, an additional study was conducted in early May 2008 in collaboration with the US Geological Survey to map the injection well plumes in Kahekili and Kihei with the following parameters: (1) δ15N in macroalgae, (2) temperature, (3) salinity, (4) turbidity, (5) dissolved oxygen (6) pH, (7) chlorophyll a (8) fluorescence (9) conductivity (10) δ15N of water column samples, (11) nutrient concentrations of water column samples (12) waste indicator compounds of water column samples and (13) pharmaceuticals. All sampling occurred in the intertidal along approximately 2km of coastline spanning the waste water treatment plants in both Kahekili (Figure 10) and Kihei (Figure 11). " (p. 8)

"The abovementioned Maui coastline survey of intertidal macroalgae successfully detected elevated δ15N values of samples that were likely influenced by sewage effluent percolating into the near shore marine environment in certain areas." (p .9)

"Nuisance algal blooms of the red alga *Hypnea musciformis* and the green alga *Ulva fasciata* are problematic in shallow coastal waters around urbanized regions of Maui. The Kahekili area is an area of problematic algal growth and substantial reef decline. Kahekili has the highest macroalgal δ15N values on Maui, which strongly indicates the presence of sewage effluent in the near shore marine environment. Sewage effluent contains elevated levels of many nutrients, some of which are important for algal growth and photosynthetic needs. From laboratory studies with reagent grade nutrient enrichment, we see that Nitrogen and Phosphorous play important roles in the photosynthetic needs of *Hypnea musciformis*, but are unable to promote excessive growth by themselves. Our sewage effluent addition experiments resulted in growth rates similar to those observed in bloom situations for both *H. musciformis* and *Ulva fasciata*, which were significantly higher with increasing levels of sewage effluent, whereas no significant difference was found between treatment for *Acanthophora spicifera* and *Dictyota acutiloba*. Therefore, in terms of growth, *H. musciformis* and *U. fasciata* similarly respond to excess nutrients more positively and faster than *A. spicifera* and *D. acutiloba*. Additional results from the sewage effluent addition experiments were that (1) *U. fasciata* requires fewer nutrients to increase photosynthetic performance (RETRMAX) than what is required for both *H. musciformis* and *A. spicifera*, (2) *U. fasciata* is more sensitive to decreased nutrient conditions in terms of photosynthetic efficiency (Alpha) than all other species tested, (3) all species, except for *D. acutiloba*, positively respond to excess nutrients in terms of building photosynthetic capacity (EK) and *U. fasciata* is the most responsive, and (4) the native, non-bloom forming reef plant *D. acutiloba* does not enhance photosynthetic properties in the presence of elevated nutrients, and naturally has higher photosynthetic efficiency than bloom forming algae. Substantial decreases in Nitrogen, Phosphorous, Iron, and Molybdenum were found over a 24hr time period in the *H. musciformis* experiment, which displays the ability of this species to utilize substantial levels of these nutrients in a short amount of time." (p 12)

Appendix 2 – Hawaii's Constitutional "Public Trust" Mandate
For Hawai'i's Waters and Relevant State Water Quality Policies and Standards

The first sentence of Article XI, Section 7 of the Hawaii Constitution reads: "The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people." http://hawaii.gov/lrb/con/conart11.html

Article XI, Section 1 of the Hawai`i Constitution, entitled "Conservation and Development of Resources," provides:

> "For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State. All public natural resources are held in trust by the State for the benefit of the people." [emphasis added]

This provision has been interpreted by the State Supreme Court to mean that "the public trust doctrine [is] a fundamental principle of constitutional law in Hawai'i" and further that "*the public trust doctrine applies to all water resources without exception or distinction*." Kelly v. 1250 Oceanside Partners, No. 26813 (HI Supreme Court, 2006). – http://www.state.hi.us/jud/opinions/sct/2006/26813.htm [emphasis added] This would clearly include so called "wastewaters."

The *Kelly* opinion also holds that this "public trust" doctrine applies to all counties as well as the State of Hawaii: ". . . as a political subdivision of the State of Hawai`i, the public trust duties imposed on the [S]tate under [a]rticle XI, section 1, also apply to the County." Id.

Thus, Maui County has an affirmative duty under the Hawaii constitution to protect all waters and natural resources in the public interest, including future generations. The Supreme Court has interpreted this provision as imposing an affirmative "duty . . . to assure that the waters of our land are put to reasonable and beneficial uses" and a "duty to ensure the continued availability and existence of its water resources for present and future generations Id.

These duties of public stewardship of the state's waters may not be executed passively. The public trustee "must take the initiative in considering, protecting, and advancing public rights in the resource at every stage of the planning and decision-making process." Id.

Finally, as the Hawaii Supreme Court explained in the case known as "Waihole I", the public trust constitutional mandate incorporates and ratifies the precautionary principle: "Where scientific evidence is preliminary and not yet conclusive regarding the management of fresh water resources which are part of the public trust, it is prudent to adopt 'precautionary principles' in protecting the resource. That is, where there are present or potential threats of serious damage, lack of full scientific certainty should not be a basis for postponing effective measures to prevent environmental degradation. In addition, where uncertainty exists, a trustee's duty to protect the resource mitigates in favor of choosing presumptions that also protect the resource." In the Matter of the Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments and Petitions for Water Reservations for the Waihole

Ditch Combined Contested Case, No. NO. 21309 (HI Supreme Court 2000). -- http://www.state.hi.us/jud/21309op.htm

The County of Maui is seeking a wastewater injection permit for the Lahaina POTW without adequately exploring the feasibility of other options that would be less damaging to natural resources of Hawai'I as required by the state's constitutional mandate to "conservation" and "public trust" mandates. In this case, beneficial reuse of the Lahaina treated sewage wastewaters should have been explored as a preferable alternative to continued injection of wastewaters – as the Mayor's May 22, 2009 goal indicates, but the County has thus far failed to do so. By failing to conduct an adequate exploration of these alternative water uses, the County is violating the Constitution of the State of Hawaii (Article XI, Section 1) and its "public trust duty". These provisions should be regarded as "qualitative" water quality standards of the state, and should be respected by EPA not overridden – in keeping with the policy of section 510 of the federal Clean Water Act.

The EPA should not as a matter of policy, and may not as a matter of law, issue an underground injection permit to a county-owned POTW in Hawaii authorizing injection of wastewaters where the permit application was filed in violation of the Constitution of the State and the public trust duty of the County.

- See Kelly v. 1250 Oceanside Partners, NO. 26813 (HI Supreme Court, 2006), where it is held that counties as well as the State are bound by Art. XI, section 1 of the Hawaii State Constitution, and where the Court makes clear that this provision imposes on the State and counties the affirmative duty to "to assure that the waters of our land are put to reasonable and beneficial uses" and "to ensure the continued availability and existence of its water resources for present and future generations Id.

- See also: The *2004 Hawaii Water Reuse Survey and Report – Final Report*, prepared for DNLR by Limtiaco Consulting (2005), p.7, which concludes "*Water reuse should be viewed as a key component of sustainable water resource management.* Recycled water can be a drought-proof and reliable supply of water. It can replace potable water that is currently used for non-potable purposes. In some instances, the availability of recycled water has stimulated Hawaii's economic development by attracting business activity. Water reuse also provides a mechanism for nutrients in wastewater to be utilized by vegetation, thereby reducing the need for fertilization in most instances. Finally, *water reuse is recognized as an environmentally preferred method of disposing treated wastewater (effluent), when compared to the traditional disposal methods through outfalls and injection wells*. While water reuse applications have grown significantly in Hawaii in recent years, recycled water is still an underutilized resource with many opportunities for expansion." – http://www.state.hi.us/dlnr/cwrm/publishedreports/PR200502.pdf

Water reuse is an even greater imperative where, as on Maui, we face recurrent drought, serious brush fires, water scarcity for agricultural irrigation and the curtailment of some

agricultural land uses, mandatory water conservation measures, unfulfilled demands for restoration and replenishment of stream flows, and constraints on new construction due to unavailability of adequate water supplies.

Appendix 3: Maui Is In the Midst of a Multi-Year Drought And Should Not Be Discarding Valuable Water Resources

This is not something that requires much proof for someone who lives on Maui. But for those who don't see:

1. **County of Maui, *Drought Mitigation Strategies* (Oct. 2004), p. 1 – http://hawaii.gov/dlnr/cwrm/drought/info/MAUI%20REPORT%20-%20Final%2011-18-04.pdf**

"Drought is one of the most obstinate and pernicious of natural disasters which, at its most severe form, decimates crops and livestock, erodes the landscape, damages territorial and aquatic habitat, contributes to widespread wildfire, and results in hundreds of millions of dollars in damage. . . . Drought can lead to tough decisions regarding allocation of water, stringent water use limitations . . ., problems in ensuring safe drinking water supplies and adequate water supplies for firefighting efforts."

2. ***2005 Hawaii Drought Plan*, http://www.state.hi.us/dlnr/cwrm/drought/info/HDP2b.pdf**

"'Risk management,' or using a proactive approach to drought management, is preferable to the usual reactive or "crisis management" approach. . . . In areas of the State where water resources are limited, the development of alternative water supply sources such as *wastewater reuse*, surface water treatment, desalting brackish or ocean water, constructing water reservoirs, and storm water runoff reclamation should be explored." [emphasis added] (pp 8-1, 8-4).

3. ***State of Hawaii Multi-Hazard Mitigation Plan, 2007*, Table 3-18, p. – http://www.scd.state.hi.us/HazMitPlan/chapter_3.pdf**

According to the Hawaii Drought Monitor, Commission on Water Resources Management, Maui has had periods of serious drought on a relatively recurrent basis nearly every year since 1996.
"Drought conditions heighten the potential incidence, extent and rapidity of the spread of wildfire. Wildland fires not only endanger human lives at the urban/wildland interfaces, but also endanger species of flora and fauna, which already may be especially susceptible due to drought conditions." (p. 3-50 – 51)

4. **Dicus, "Drought Hits Maui, Worsens on Big Island," *Pacific Business News*, June 13, 2007 – http://www.bizjournals.com/pacific/stories/2007/06/11/daily23.html?from_rss=1**

5. **"Maui Drought Amplifies Calls for New Reservoir," *KHON – 2*, May 29, 2008 – http://www.khon2.com/news/local/19347504.html."**

"On the west side, Lahainaluna has seen less than 2 inches of rain this year [2008], 15 percent of the normal rainfall at this time. Kihei usually receives nearly 10 inches by now, but only an inch and a half has fallen."

6. **"Farmers eligible for drought aid," *Maui News*, August 2, 2008:**

"Ongoing dry conditions have led to the designation of Maui County, and the rest of the state, as federal disaster areas by U.S. Agriculture Secretary Edward Schafer, Hawaii U.S. Sens. Daniel Inouye and Daniel Akaka announced Friday."

"In Maui, in April-June 2008, there was a 31 percent shortage in average rainfall."

Appendix 4 – The costs of continuing to do damage to the reefs has been demonstrated.

The economic value of the reefs must be considered by the Agency when assessing whether the County has met its burden of proof and how much nitrogen and other nutrients to allow in any conditions of a UIC permit.

1. **Friedlander et al., *The State of the Coral Reef Ecosystems of the Main Hawaiian Islands*, (2008), p. 219 -- http://ccma.nos.noaa.gov/ecosystems/coralreef/coral2008/pdf/Hawaii.pdf**

"The economic value of Hawaii's coral reefs was estimated at US$10 billion with direct economic benefits of $360 million per year in 2002 (Cesar and van Beukering, 2004)."

2. **Cesar et al., Economic Evaluation of the Coral Reefs of Hawaii – Final Report, NOAA Coastal Ocean Program (2002) -- http://www.coralreef.gov/meeting18/evhcri_samoa_2007.pdf**

"the associated economic benefits of [the] elimination [of algal blooms] are such that major spending is justified. For instance, upgrading the sewerage plant is estimated to cost $ 13 million in capital investments and $ 0.5 million per year in operating costs. These costs fall well within the economically justifiable 'spending envelope', if leaching from injection wells turns out to be a major contributor to the algae blooms. Note that several important additional benefits, such as reductions in health risks and water savings, have been excluded from the study. Therefore, even larger expenditures on sewerage and run-off reductions would certainly be a worthwhile investment; they would benefit both the economy and the marine environment."

This is a conservative estimate in other respects as well, as it does not take into account the current value of these costs and damages, nor does it take into account the economic value to those who sell other support services to tourists and visitors who come to Hawaii to enjoy the ocean-based activities and resources.

3. Limtiaco Consulting Group, *2004 Hawaii Water Reuse Survey and Report – Final*, prepared for HI DNLR (2005), p. 7 – http://www.state.hi.us/dlnr/cwrm/publishedreports/PR200502.pdf

"In some cases, it may be actually less expensive to develop recycled water distribution systems rather than developing new sources of water and continue to pay effluent disposal costs. While there are significant initial capital costs for communities to develop recycled water distribution systems, the addition of recycled water into their water budgets will secure long-term solutions to sustainable economic growth plans."

Appendix 5 – There is ample evidence of that previously wastewater, if treated properly, can feasibly and safely be re-used

1. **"**Water reuse from sewage effluent for irrigation will augment natural water resources, furnish supplemental or alternative fertilizer, and reduce ocean water pollution and the costs of engineering systems. In cooperative field testing from 1971 to 1975, it was demonstrated that effluent can be applied as supplemental water for furrow irrigation of sugarcane without detriment to ground water quality and sugar yield." Lau, Professor of Civil Engineering, and Director, Water Resources Research Center, University of Hawaii, "Water Reuse from Sewage Effluent by Irrigation: A Perspective from Hawaii," *Journal of the American Water Resources Association*, Vol. 15, Issue 3 (2007), pp. 740-752 – http://www3.interscience.wiley.com/journal/119607875/abstract?CRETRY=1&SRETRY=0

2. The Hawaii Department of Health has issued standards, which if followed would permit the environmentally safe and healthy reuse of wastewater effluence in a variety of contexts. ". . . wastewater management practices that protect, conserve and fully utilize water resources are vital to Hawaii. Increasing the safe use of recycled water can greatly assist in meeting water requirements of the State, enhance the environment, and benefit public health by preserving resources upon which public health protection is based. The Department of Health has long been an advocate for water reuse as long as it does not compromise public health and our valuable water resources. Promotion of the use of recycled water is one of the Department's high priority goals." Hawaii Department of Health, Wastewater Branch, *Guidelines for the Treatment and Use of Recycled Water*, May 15, 2002, p. 1 – http://hawaii.gov/health/environmental/water/wastewater/pdf/reuse-final.pdf See also pp. 19-21 for a list of the many permissible uses for R-1 treatment level recycled wastewaters.

3. EPA also has issued *Guidelines for Water Reuse*, EPA/625/R-04/108, September 2004 – http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf -- which state at the outset: "In an effort to help meet growing demands being placed on available water supplies, many communities throughout the U.S. and the world are turning to water reclamation and reuse. Water reclamation and reuse offer an effective means of conserving our limited high-quality freshwater supplies while

helping to meet the ever growing demands for water." P. iii. These guidelines apply specifically to "the effluent generated by domestic wastewater treatment facilities (WWTFs)." P. 2. The guidelines indicate, "In many instances, treated wastewater may provide the most economical and/or available substitute source for such uses as irrigation of lawns, parks, roadway borders, and medians; air conditioning and industrial cooling towers; stack gas scrubbing; industrial processing; toilet flushing; dust control and construction; cleaning and maintenance, including vehicle washing; scenic waters and fountains; and environmental and recreational purposes." Id. Chapter 6 of the Guidelines also contains a lengthy discussion of possible sources of funding to pay for any new wastewater reuse initiative. Id. at pp. 199-220.

4. See also: EPA Tentative Decision Denying 301(h) permit for Honouliuli Waste Water Treatment Plant (2007), where it is noted at p. 3, that "Since receiving the 1991 permit for the HWWTP, CCH has upgraded this treatment plant, with the objective of reusing treated water for purposes such as irrigation". http://www.epa.gov/region09//water/npdes/pdf/honouliuli/fact-sheet-honouliuli-3-26.pdf

5. See story on Gilroy and Morgan Hill, CA where treated wastewaters have been re-used "to irrigate some parks, golf courses and farms". http://www.morganhilltimes.com/news/124006-treated-wastwater-can-go-into-river

6. See North Carolina guidelines on wastewater reuse for a variety of purposes, including fire prevention and drought alleviation. http://h2o.enr.state.nc.us/lau/reclaimed.html#Drought

7. On-land reuse of treated wastewater has been a preferred strategy and used in New South Wales, Australia; New Zealand; Mexico; and Rotorua -- see: http://www.watercorporation.com.au/_files/publicationsregister/2/bunbury_summary.pdf; http://www.ccc.govt.nz/WasteWater/Lyttelton/#PreferredOptions; and http://www.iic.int/projects/view.asp?id=257

8. See also the information on the DIRE Coalition web site – http://dontinject – and reports and case studies sited there under the "Experience" page of other communities that have successfully increased reuse of wastewater. See the "Safety" page on that web site for information regarding the safety standards that should be applied to ensure that reused wastewater is treated appropriately for the particular intended uses.

Appendix 6– Start to Finish Construction Times
For Wastewater Treatment/Reuse Plants

In Mayor Tavares' email to the DIRE Coalition dated August 19, 2009, she indicates that "Realistically, I don't believe I can deliver a completed plan whose result would be no injection by the END of the five years." We do not know the basis for this statement, for the Mayor provided no information along with this email to explain the basis for this belief. Suffice it to say that although the County has the burden of proof to show why the

10 year permit that it is asking for is needed, it has not provided any proof to show that the project will take even longer than five years.

It is the position of the DIRE Coalition that five years is ample time to complete the project if there is the determination to do so. We do not believe that it will take 18 months of meetings before a workable plan can be devised. We think that this can be done in 12 months at most (including development of designs for the construction). **The following information demonstrates that construction of even a complex project (such as a wastewater treatment/reuse plant and related piping) generally does not take more than two and a half to three and a half years, perhaps less:**

1. The Orange Water and Sewer Authority (OWASA), Chapel Hill, NC and the University of North Carolina estimated that their wastewater treatment improvement reuse project costing $50 million could be completed in three years. http://gazette.unc.edu/archives/04aug11/morestories.html, and http://www.co.orange.nc.us/OCCLERKS/0404292a.pdf

2. The Douglasville-Douglas County Water and Sewer Authority (GA) has contracted with a Swedish firm to build a replacement sewage treatment plant for over $52 million. The complex project, involving "excavation of some 535,000 cubic meters of earth, rock blasting of about 107,000 cubic meters, installation of more than 15 kilometers of process piping, pouring of approximately 19,000 cubic meters of concrete with 2,270 metric tons of reinforcing steel . . . is scheduled to be completed in approximately two and half years." http://www.globenewswire.com/newsroom/news.html?d=87410

3. San Diego (CA) County Water Authority entered into a $159 million contract in September 2005 to "design and build" a 100 million gallon/day sewage treatment plant specifying "completion of the water treatment plant in 2008." http://www.waterwebster.com/SanDiegoCH2MHillwaterplant.htm

4. Palm Valley Water Reclamation Facility, Goodyear, AZ – over 4 million gallon a day facility featuring "advanced biological nutrient removal disc filtration, UV disinfection" and other processes was completed "in less than 18 months from start to finish." http://www.pacewater.com/pdf/env_water.pdf

5. Springfield, Missouri undertook a "$24 million expansion and improvement of Springfield's Southwest Sewage Treatment Plant," which "broke ground in February 2003" with a targeted completion date in Spring 2005". http://www.mcilvainecompany.com/sampleupdates/MWTPUpdateSample.htm.

6. Pima County, AZ plans includes $25 million for the 4.0 MGD Avra Valley WWTF Expansion Project and "and completion of the project is anticipated within two years." http://www.pima.gov/wwm/wac/minutes/Minutes05-17-07.pdf

7. The Tracy (CA) Wastewater Treatment Plant Retrofit, involving an over $145 million upgrade and expansion of facilities constructed in the 1950s was undertaken under tight EPA ordered timelines. Among other things, its purpose

was to “produce high-quality recycled water that can be used for landscape irrigation, cooling water, and other environmentally beneficial applications.” Although construction did not start until 2004, it was expected that completion would occur by the end of 2006.” http://www.bentley.com/fr-FR/Corporate/Publications/Case+Studies/Water+and+Wastewater/CH2MHILL.htm

8. Brisbane, Australia: The project has successfully built a water supply network for South East Queensland that consists of a 200 km (124 miles) of large-diameter underground pipeline, three advanced water treatment plants, storage tanks and pumping stations. The supply network will have the capacity to deliver 232 million liters per day (MLD) -- 61 million gallons per day (mgd) -- of purified recycled water to power stations, industry, agriculture and the Wivenhoe Dam. Black & Veatch, working in a joint-venture with Thiess, was responsible for the design, construction and commissioning of the Bundamba Advanced Water Treatment Plant, the first of the three advanced water treatment plants to come on-line. Stage 1A of the plant, which was completed in only 10 months -- about half the time expected for a similar facility.” http://www.waterworld.com/index/display/article-display.articles.waterworld.industrial-water.advanced-water-treatment-plant-receives-global-engineering-industry-recognition.QP129867.dcmp=rss.page=1

9. Emerald Coast (Escambia County), FL: Replacing a 73 year old sewage treatment facility with a new Central Water Reclamation Facility (CWRF), which will generate 17 million gallons/day of reusable effluent, the Emerald Coast Utility Authority saw construction activity begin in July 2007 and expects completion in the fall of 2010. http://www.ecua.org/wwtp/default.asp

10. The Petaluma, California plant took 3 years and 8 months from start of construction to start up of operations even with delays caused by "heavy winter rains in late 2005 and early 2006 [that] used up all the expected weather days, inundating the newly graded site and dashing hopes of an early finish." http://www.pressdemocrat.com/article/20090723/COMMUNITY/907229898?Title=Sewer-plant-now-up-and-running

DIRE Coalition . . . Don't Inject, RE-direct . . . because the situation is dire.
310 Piliwale Rd.
Kula, HI 96790

Overview: Supplemental Submission to EPA on Lahaina Injection Well UIC Permit 9/20/09

The following supplemental information is submitted on behalf of the DIRE Coalition of Maui with respect to the County of Maui's currently pending application for renewal of its underground injection permit under the federal Safe Drinking Water Act. This information supplements the testimony and accompanying written submission presented at the August 20, 2009, EPA hearing at the Lahaina Civic Center, as well as previous comments submitted by DIRE and its individual and group members. We continue to believe and have attempted to demonstrate in these and previous comments that the County of Maui has failed to bear its burden of persuasion of entitlement to a 10-year permit renewal at levels requested. Accordingly, the DIR Coalition petitions EPA not only to reject the request for a 10 year permit renewal but to limit any renewal permit to five years duration (given the 15 years already received by the county in fact under the existing permit) and to impose more stringent interim requirements (even than those proposed by EPA in its revised proposed permit) on injection in order to meet the Agency's responsibilities under the Clean Water Act, E.O. 13089, and other important authorities and protect Maui's environment and the health of its residents.

Overview: In the supplemental comments which follow, the DIRE Coalition makes the following points in addition to those made above and previously:

1. **EO 13089, 40 CFR 144.4(f) and 40 CFR 144.36(c) Require that EPA Limit the Duration and Interim Pathogen and Nutrient Releases Allowed Under Any UIC Permit That May Be Granted:** The UIC regulations at 40 CFR 144.4 make clear that any UIC permit that is granted must comply with a variety of other requirements beyond those specified in the Safe Drinking Water Act and its implementing regulations. These include Executive Orders (40 CFR 144.4). Executive Order 13089 on "Coral Reef Protection" requires "All Federal Agencies" [including the Environmental Protection Agency] to "(a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems." Because the granting of a 10-year UIC permit for the Lahaina injection wells has clearly been demonstrated to contribute harmful nutrients that promote algae growth and harm coral reef ecosystems in West Maui, the Agency is required to use its authority under 40 CFR 144. _ (c) to limit the term of any permit it grants to the shortest period of time necessary to put in place necessary treatment upgrades and land-base reuse of wastewater and during the interim to restrict nutrient releases to the lowest levels achievable during that time.

2. **By its own terms, 40 CFR 144.4 is not an "exhaustive" list of the other federal laws that may be required to be considered before EPA may issue a UIC permit.** The Clean Water Act and the requirements of EO 13089 must be considered and complied with as well.

3. **Regardless of how section 144.4 is construed, the current record demonstrates persuasively that the County is now discharging pollution through the Lahaina injection wells into the ocean without an NPDES permit in violation of the Clean Water Act.** Given EPA's actual knowledge of the hydrological connection between the Lahaina injection wells and the release from those wells of pollutants into the ocean (and thus the knowledge of this Clean Water Act violation), EPA may not grant the UIC permit to allow the very behavior that violates the Clean Water Act until and unless the County agrees to a compliance schedule to obtain and meet all applicable requirements of an NPDES permit for these injection wells.

4. **The one state that has considered this specific issue – whether indirect discharges where injected "wastewater and affected groundwater will discharge to surface water after leaving the waste management area," are subject to NPDES permit requirements-- has concluded that NPDES permits are required.** While the Oregon interpretation is not binding on EPA or the County, it is deserving of weight in the Agency's determination of whether or not to grant a UIC permit without the county first committing to comply with the NPDES requirements of the Clean Water Act.

5. The requirements of Section 307 of the Coastal Zone Management Act have not been satisfied. The proposed permit would be inconsistent with the policies and objectives of the Hawaii CZM plan. In the absence of meeting all applicable CZM requirements, EPA is prohibited by the Safe Drinking Water Act regulations (40 CFR 144.4(d)) from granting the 10-year permit that the County has requested and may not lawfully allow increases in total effluent volumes or in actual total nitrogen levels going into the wells.

6. **Effect of the Mayor's Testimony: The Mayor's Testimony at the August 20 Hearing Makes Clear that Wastewater Effluent Promotes Algal Growth.** That algal growth is clearly known to be harmful to coral reefs. This must be considered when assessing the implications of EO 13089, the "significant nexus" Clean Water Act test under Rapanos, and for all other purposes of the DIRE Coalition's arguments and presentations.

7. **A Number of Additional Articles and Reports Support the DIRE Coalition's Concern about the Harmful Effects of Nutrients being Released into the Ocean and their Deleterious Effect on Coral Reef Ecosystems.** Looked as a whole, the record underscores the need for EPA to restrict any permit granted and for the County to curtail injection at the Lahaina plant as soon as possible and to obtain an NPDES permit for the discharges through the wells into the ocean.

8. **On the current record considered as a whole, it would be "arbitrary, capricious, an abuse of discretion, [and] not otherwise in accordance with law" for EPA to grant a 10-year permit for continued injection of wastewater effluent at the Lahaina Wastewater Treatment Plant, to allow higher levels of effluent and nutrient to flow into the wells and into the oceans than is occurring currently, and to fail to insist on the County obtaining an NPDES permit for the discharges through the wells into**

the ocean. The Mayor's testimony at the August 20 hearing in favor of ending injection wells as soon as possible and reusing the water underscores this point.

9. **The Lahaina News Has Editorialized "Get Rid of Injection Wells".** Public testimony and record submissions – over 200 of them – have been unanimous as well – in opposing the granting of a 10-year permit and in favor of more stringent limits on effluent and nutrient loadings to be allowed into the wells in the interim before the wells are shut down.

Supplemental Submission for EPA Record on Lahaina Injection Well Permit

The following supplemental information is submitted on behalf of the DIRE Coalition of Maui with respect to the County of Maui's currently pending application for renewal of its underground injection permit under the federal Safe Drinking Water Act. This information supplements the testimony and accompanying written submission presented at the August 20, 2009, EPA hearing at the Lahaina Civic Center.

1. **EO 13089: Executive Order 13089 Requires Any Renewal of the Lahaina Permit to Be as Short a Duration as Feasible before Adequate Treatment and Reuse Can Be Implemented and That The Most Stringent Controls Feasible Be Placed on the Nitrogen, Phosphorus and Pathogens in the Effluent Going into the Wells in the Interim**

We call your attention to Executive Order 13089 – "Coral Reef Protection," June 11, 1998 - http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=1998_register&docid=fr16jn98-142.pdf. That Executive Order applies to ''U.S. coral reef ecosystems.'' This is defined in Section 1 (a) to mean "those species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., Federal, State, territorial, or commonwealth waters), including reef systems in the south Atlantic, Caribbean, Gulf of Mexico, and Pacific Ocean." Clearly, the coral reef systems of West Maui fall within this definition.

Section 2 of EO 13089 states,

> "**Sec. 2.** *Policy.* (a) All Federal agencies whose actions may affect U.S. coral reef ecosystems shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems."

This provision of the Executive Order is mandatory – as evidenced by the word "shall". The Environmental Protection Agency is clearly a "Federal agency" within the meaning of EO 13089. For the reasons stated in our previous submissions and those of our allied member groups, including our submission on August 20, 2009, and considering the amount of nitrogen that may be allowed to enter the wells and the ocean under a 10-year permit, EPA's decision on the Lahaina injection well permit undoubtedly "may affect [the] US coral reef ecosystem" of West Maui. It follows then that the requirements of section 2 (b) and (c) of EO 13089 apply to

the current Lahaina injection well permit proceeding, unless one of the exceptions of section 3 apply. Neither of these exceptions does apply, nor has the County even claimed that they do. *Thus, EPA is required to follow the requirements of Section 2 (b) and (c) of EO 13089 in the Lahaina injection well permit decision.*

Specifically, EPA clearly has the "authority" under 40 CFR 144.36 (c) to grant a UIC permit for a period less than 10 years. Each additional year of a permit will allow more algae-promoting nutrients to go down the wells in Lahaina and into the ocean and thus more degradation of the "coral reef ecosystem" of West Maui. That is what the Division of Aquatic Resources of the State of Hawaii has written in its submissions to this record and that is what the record as a whole demonstrates. As indicated in Point #4 below, the Mayor's own statement at the August 20, 2009 hearing – that she wants to use the nitrogen in the wastewater effluent to grow algae for energy – makes this abundantly clear. *Therefore, the Regional Administrator (Director) is required by EO 13089 to use this authority under 40 CFR 144.36(c) not to grant the full 10 year permit requested by the County.* Instead, the time allowed should be the shortest time reasonably necessary to put in place alternative wastewater treatment and reuse plans and facilities and by this means better "protect . . . the coral reef ecosystem" of West Maui. *In addition, these provisions of EO 13089 require the Director to impose interim conditions on the permit to reduce to the maximum extent feasible the levels of nitrogen, phosphorus, and pathogens that are allowed in the effluent that goes into the wells and then into the ocean.*

These requirements of EO 13089 are further underscored by Section 3 of that Executive Order, which requires federal agencies "whose actions affect U.S. coral reef ecosystems . . . [to] provide for implementation of measures . . . reducing impacts from pollution." EO 13089 thus imposes an affirmative duty on the Director to protect coral reef ecosystems from land-based "pollution" such as the Lahaina wastewater effluents.

Moreover, we point out that the "authorities" that EPA has under existing law to reduce "impacts from pollution," "to protect and enhance [US coral reef ecosystems]," and "not degrade the conditions of such ecosystems" are not merely those under the Safe Drinking Water Act; they include authorities that EPA has under the Clean Water Act, including (a) the authority to require an NPDES permit for any point source that discharges pollution to the oceans, and (b) the authority to require other necessary actions under the watershed management requirements of that Act. We specifically endorse the views of Robin Knox in this regard.

Executive Orders are to be given the full force and effect of law, unless they are inconsistent with federal legislation or the US Constitution or plainly without any constitutional or statutory authority. *Dames & Moore v. T. Regan,* 453 U.S. 654 (1981); *Building and Construction Trades Dep't, AFL-CIO, et al. v. Allbaugh,* 295 F. 3rd 28 (DC Cir. 2002) -- http://www.ll.georgetown.edu/federal/judicial/dc/opinions/01opinions/01-5436a.html.

In the present situation, the issuance of EO 13089 clearly was within the President's authority as indicated by the statutes cited in the preamble to the Order. Moreover, the application of Sections 2 (b) and (c) to the Lahaina Injection Well permit proceeding would not be inconsistent with federal constitutional or statutory law. See: http://www.nepa.gov/nepa/regs/eos/eo13089.html.

Of particular importance for the Lahaina Injection Well permit is the fact that EO 13089 was issued in part on the basis of the authority of the Coastal Zone Management Act -- 16 U.S.C. 1451, *et seq*. and that the Coastal Zone Management Act is one of the Acts listed in EPA's Safe Drinking Water Act regulations (40 CFR 144.4) "that may apply to the issuance of permits under these rules. When any of these laws is applicable, its procedures must be followed. When the applicable law requires consideration or adoption of particular permit conditions or requires the denial of a permit, those requirements also must be followed." The Executive Order is both authorized by law and mandatory as it pertains to terms and conditions of EPA permits that "may affect coral reef ecosystems." That includes the Lahaina Injection Well permit, as the record as a whole so powerfully documents.

In this regard, see also 40 CFR 144.4(f), which provides that "Executive Orders" are among the legal requirements that are "applicable" and must be followed. If EPA is to follow the mandates of EO 13089, it must (a) limit the duration of the permit to the minimum time necessary to manage the wastewater differently than placing in injection wells (e.g., to put in place appropriate treatment upgrades and land-base wastewater effluent reuse systems), and (b) limit the amount of nutrients going into the wells in the interim, so that no more than current levels of effluent, total nitrogen, and phosphorus, are allowed, and so that other means to further reduce these levels are achieved as soon as feasible; and (c) require the County to obtain an NPDES permit and meet necessary effluent and water quality standards, including the objectives and policies of the Hawaii Coastal Zone Management Program described below.

2. <u>By its own terms, 40 CFR 144.4 is not an "exhaustive" list of the other federal laws that may be required to be considered before EPA may issue a UIC permit. The Clean Water Act and the requirements of EO 13089 must be considered as well.</u>

Section 144.4 of 40 CFR states in part,

> "The following is a list of Federal laws that may apply to the issuance of permits under these rules. When any of these laws is applicable, its procedures must be followed."

This provision does not say that this is "an exhaustive," "comprehensive," or "complete" list. It is simply "a list of Federal laws [then in existence] that may apply." Nor does it say, this is "the" list of Federal laws that may apply. Thus, it follows that a plain meaning reading of the regulation is that other federal laws – not specifically listed in 144.4 – including those adopted after promulgation of 144.4 -- may also apply to the issuance of a UIC permit. See: *Thomas Jefferson Univ. v. Shalala*, 512 U.S. 504, 512, 114 S. Ct. 2381, 2386, 129 L.Ed.2d 405 (1994) ("[W]e must defer to the [agency's] interpretation unless an "alternative reading is compelled by the regulation's plain language....' ") (quoting *Gardebring v. Jenkins*, 485 U.S. 415, 430, 108 S. Ct. 1306, 1314, 99 L.Ed.2d 515 (1988)).

By the same token, see *Legal Enforcement Assistance Foundation v. USEPA*, No. 95-6501 (11th Cir. 1997), note 12. In that footnote, the Court indicated that a list of problems identified in the House Committee Report which caused Congress to determine that the UIC program was necessary should not be construed as an exhaustive or complete list of such problems, but only

an illustrative list, not limiting given the overall purpose and language of the Safe Drinking Water Act.

The federal Clean Water Act, the federal Resource Conservation and Recovery Act, and the federal Pollution Prevention Act are prime examples of federal laws which may also be applicable to the issuance of a UIC permit, and which, if they do, must be followed under the policy of 40 CFR 144.4. See, for example, 40 CFR 270. 1 -- http://law.justia.com/us/cfr/title40/40-26.0.1.1.4.1.37.1.html. Similarly, EPA may reasonably be required (or at least authorized) by the Coral Reef Conservation Act of 2000 to take its policies into consideration when deciding whether or on what conditions a UIC permit should be issued which may affect coral reef ecosystems. Likewise, injection of low level radioactive wastes could be subject not only to the federal Safe Drinking Water Act, but also to the "Low-level Radioactive Waste Policy Amendments Act of 1985," even though this piece of legislation is not explicitly listed in 40 CFR 144.4. See: http://www.nrc.gov/waste/llw-disposal.html.

3. The current record is persuasive that the County is now releasing pollution through the injection wells into the ocean without an NPDES permit in violation of the Clean Water Act.

This is not a situation in which it is alleged that a new UIC permit could possibly lead to a release to the ocean. In this case a responsible County official has admitted on the record at the November 2008 hearing, and the rest of the overall record independently corroborates that admission, that the nutrient-laden effluent injected into the Lahaina wells is not contained in the wells, but flows from there into the ocean. Now EPA has actual knowledge of that fact.

Under these circumstances where a clear hydrological connection has been demonstrated between the Lahaina injection well and the surface water (ocean) to which the injectate is released and where the nexus between the two is clearly "significant" under the Rapanos and Northern California River Watch cases cited in our previous submission, it would be an abuse of discretion for EPA to:

(a) grant the 10 year UIC permit,
(b) fail to order the County to obtain an NPDES permit,
(c) fail to impose conditions requiring the County to take the related steps necessary to cap actual nutrient loadings, further reduce the nutrient levels and pathogens to the maximum extent feasible, and reduce the harmful effects of its discharge to and through the injection wells into the ocean.

None of the previous decisions of EPA that have limited the UIC permit decision to the impact of the injection on drinking water supplies have confronted a factual situation such as this one, where the injection activity is admitted by the applicant and known to the EPA to be resulting in violation of the Clean Water Act. Under these circumstances, and particularly given EO 13089 and 40 CFR 144.4(f) – see below – the Agency may not ignore these facts, but must insist on conditions and controls to ensure compliance with the Clean Water Act and reduction of the impact of the injection wells' releases to the ocean on sensitive coral reef ecosystems of West Maui.

While it is true that the 5th Circuit Court of Appeals has held that the Clean Water Act does not *generally* confer on the Administrator of EPA the authority to require NPDES permits for underground injection wells, it is important to note that the Court specifically did not deal with the factual circumstances presented by what we now know about the Lahaina injection wells. Note 1 of the Court's decision in Exxon Corp. v. Train, 554 F. 2d 1310 (5th Cir. 1977) addresses this point expressly:

> "Specifically, EPA has not argued that the wastes disposed of into wells here do, or might, 'migrate' from groundwaters back into surface waters that concededly are within its regulatory jurisdiction. Cf. Comment, Groundwater Pollution in the Western States Private Remedies and Federal and State Legislation, 8 Land & Water L. Rev. 537, 557 (1973). We mean to express no opinion on what the result would be if that were the state of facts."
> http://openjurist.org/554/f2d/1310

Similarly, see note 17, indicating that in that case the EPA Administrator ". . . does not argue that disposal into these deep wells is the addition of a pollutant 'to navigable waters' within the meaning of the Act." That, however, is precisely what we, the County, and EPA now know is happening at Lahaina – the injected effluent is admitted by the County to be flowing down the wells uncontrolled into the ocean. That is why the UIC permit may not be renewed by EPA to grant the County continued authority to generate these discharges to navigable waters without requiring the County to obtain and meet the conditions of an NPDES permit and more as indicated above.

The following cases and citations provide further support for this conclusion: Leslie Salt Co. v. Froehlke, 578 F.2d 742, 754-55 (9th Cir.1978) (holding that "the term 'navigable waters' within the meaning of the [CWA] is to be given the broadest possible interpretation under the Commerce Clause"); Friends of Santa Fe County v. LAC Minerals, 892 F. Supp. 1333, 1357-58 (D.N.M.1995) (holding that the Tenth Circuit's decision in Quivira Mining Co. v. United States Envt'l. Protection Agency, 765 F.2d 126 (10th Cir.1985), cert. denied, 474 U.S. 1055, 106 S. Ct. 791, 88 L.Ed.2d 769 (1986), foreclosed "any argument that the CWA does not protect groundwater with some connection to surface waters" because the Tenth Circuit had expansively interpreted the CWA's jurisdictional reach in a non-groundwater context); Washington Wilderness Coalition v. Hecla Mining Co., 870 F. Supp. 983, 989- 90 (E.D.Wash.1994) (holding that, although "Congress did not intend to include isolated groundwater as part of the 'navigable waters' " that the CWA regulates, the CWA does apply to discharges of pollutants that reach surface waters through groundwater); Sierra Club v. Colorado Refining Co., 838 F. Supp. 1428, 1434 (D.Colo.1993) (holding that discharges into "navigable waters" include discharges that reach navigable waters through groundwater); and McClellan Ecological Seepage Situation v. Weinberger, 707 F. Supp. 1182, 1193-96 (E.D.Cal.1988), vacated on other grounds, 47 F.3d 325 (9th Cir.), cert. denied, 516 U.S. 807, 116 S. Ct. 51, 133 L.Ed.2d 16 (1995) (noting that although "Congress did not intend to require NPDES permits for discharges of pollutants to isolated groundwater," plaintiff could state a claim if it could "establish that the groundwater is naturally connected to surface waters that constitute 'navigable waters' under the Clean Water Act."). Note, too, that in its discussion of its regulations for storm water discharge NPDES permits, EPA has remarked in response to a rulemaking comment that "this rulemaking only addresses discharges to waters of United States, consequently discharges to ground water are not covered by this

rulemaking (*unless there is a hydrological connection between the ground water and a nearby surface water body).* 55 Fed. Reg. 47990, 47997 (Nov. 16, 1990). [Emphasis added].

4. **One state that has grappled expressly with this precise question has concluded that underground injection of wastewater effluent in a way that is known to result in subsequent discharge to surface water is prohibited under the Clean Water Act if done without an NPDES permit.**

The State of Hawaii has not addressed this question expressly. Nor has any court in Hawaii done so. However, the one state that seems to have addressed this question specifically, the State of Oregon, has rendered an interpretation of the NPDES rules in its Internal Management Directive entitled, "Disposal of Municipal Wastewater Treatment Plant Effluent by Indirect Discharge to Surface Water via Groundwater or Hyporheic Water," (2007) -- http://www.deq.state.or.us/wq/pubs/imds/indirectdischarge.pdf. The State concludes, "Based on site conditions and design of indirect discharge [to surface water] systems as defined in this IMD are such that 'all' the wastewater and affected groundwater will discharge to surface water after leaving the waste management area, the Department interprets its rules to require an NPDES permit . . . for these systems." (p. 11)

The same Directive provides, "For sources covered by this IMD, Department staff are directed to address this situation in the following way: The indirect discharge systems should be designed and a permit issued with conditions so that the effluent leaving the treatment system and entering surface water indirectly will meet water quality standards at the edge of the surface water mixing zone. . ." (p. 12) *That, plus other typical requirements of an NPDES permit (such as effluent limits to meet all applicable water quality standards and TMDLs and water quality monitoring), are what we are requesting (and what we believe is legally required) to control the indirect discharges to surface waters that are occurring at the Lahaina plant.*

5. **The requirements of Section 307 of the Coastal Zone Management Act have not been satisfied, and in the absence of meeting all applicable requirements, EPA is prohibited by the Safe Drinking Water Act regulations (40 CFR 144.4(d)) from granting the 10-year permit that the County has requested and is prohibited from allowing increases in total effluent volumes or in actual total nitrogen levels going into the wells.**

As 40 CFR 144.4(d) notes,

> (d) *The Coastal Zone Management Act,* 16 U.S.C. 1451 *et seq.* Section 307(c) of the Act and implementing regulations (15 CFR part 930) prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State Coastal Zone Management program, and the State or its designated agency concurs with the certification (or the Secretary of Commerce overrides the State's non-concurrence).

In this instance, the applicant (Maui County) has not certified that the proposed new 10-year permit that it has requested for Lahaina injection wells complies with the State's Coastal Zone Management program, and received a State concurrence. Nor has the Secretary of

Commerce overridden any non-concurrence by the state. Thus, EPA may not lawfully grant the 10-year permit as requested by the County. This is an express requirement of the federal Safe Drinking Water Act regulations (e.g., 40 CFR 144.4). Thus, EPA is not authorized to grant the requested permit on the current record.

It is clear that the "CZM area [of Hawai'i] encompasses the entire state." See the Hawaii Coastal Zone Management Program: http://hawaii.gov/dbedt/czm/program/program_czm.php. This includes the land as well as the ocean. "Because there is no point of land more than 30 miles from the ocean, a definite land-sea connection exists throughout the state. So, designating the entire state as the CZM area was logical. What occurs on land, even on the mountains, will impact and influence the quality of the coastal waters and marine resources." Id. That means that the injection wells of Lahaina's wastewater treatment plant fall within the CZM area, and federal permit actions must be consistent with the state's plan. "Federal license or permit activities and federal financial assistance activities that have reasonably foreseeable coastal effects must be fully consistent with the enforceable policies of state coastal management programs." NOAA, "Federal Consistency Overview," -- http://coastalmanagement.noaa.gov/consistency/welcome.html. The Hawaii State Coastal Management Plan reflects the CZM Act's distinctions between "federal activities and development projects" which must be consistent with State CZM policies and objectives "to the maximum extent practicable," and federally-issued permits – such as the UIC permit for Lahaina – which must be fully "consistent with" the state's CZM "objectives and policies." http://hawaii.gov/dbedt/czm/program/doc/1990_czm_program_doc.pdf, p. 25. See also 15 CFR 930.50-930.66, particularly 15 CFR 930.58.

Among the federal permitting activities specifically listed as subject to the Hawaii Coastal Zone Management Act "consistency" requirements are "permits . . . required under section 402 of the Federal Water Pollution Control Act" [federal Clean Water Act, as amended]. See Appendix C of the Hawaii Coastal Zone Management Program. As we have demonstrated previously and additionally in these supplemental comments, the Lahaina injection well permit cannot lawfully be issued (when EPA knows that to do so would allow continued violation of the Clean Water Act's prohibition on discharges to the ocean from this point source from or through the injection wells without an NPDES permit under section 402.) Accordingly, the UIC injection well permit may not be issued for the Lahaina injection well renewal without (1) first ensuring the issuance of an NPDES permit meeting all applicable requirements; and (2) even before that, obtaining the required "consistency" certification from the County and concurrence from the State with regard to the injection wells and NPDES permit's consistency with the State CZM "objectives and policies."

It is not within EPA's authority to waive the "applicant's" (i.e., Maui County's) duty to make the certification of consistency or to concur, when it is solely the state's responsibility to concur or withhold concurrence.

Among the relevant reef protection "objectives and policies" of the Hawai'i CZM program are the following which are relevant to this (Lahaina injection well) permit proceeding:

- I(B)(i) and (iv) – Recreational uses: "

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters;

- 4 – Coastal Ecosystems

Objective: Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:
(A) Improve the technical basis for natural resource management;

(B) Preserve valuable coastal ecosystems of significant biological or economic importance;

(C) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

Not having made the requisite certification under 40 CFR 144.4(d) and obtained the required state concurrence and not having obtained an NPDES permit, the County has not made all the requisite showings of eligibility for a UIC permit and EPA is prohibited under its own regulations (40 CFR 144.4) from granting any such permit. The fact that the Safe Drinking Water Act permits are not among those listed by the State's CZM plan as requiring consistency certifications and concurrences is not dispositive of this question, when the County also has the duty to obtain an NPDES permit and that permit is so listed in the Hawai'i CZM plan Appendix C.

6. Effect of the Mayor's Testimony: The Mayor's Testimony at the August 20 Hearing Makes Clear that Wastewater Effluent Promotes Algal Growth

The record was clear even apart from the Mayor's testimony at the August 20, 2009 hearing that the Lahaina wastewater effluent promotes the growth of algae harmful to the coral reef ecosystem of West Maui. See, for example, the studies cited in the DIRE Coalition's written submission of that date and the additional studies cited below and by others at the August 20, 2009, hearing. However, **after the Mayor's testimony that she does not want de-nitrification requirements imposed on the effluent prior to reuse, because she would like to see the effluent used in an algae to energy plant, there can be no doubt about this aspect of the "significant nexus" between the discharge of the effluent into the wells and the resultant impact in promoting algae growth in the ocean.** This is entirely relevant to the determination that the Clean Water Act NPDES permit requirements apply to these injection wells under the Rapanos and Northern California River Watch cases discussed in the DIRE Coalition's written submission of August 20, 2009.

7. The Following Additional Articles and Reports Support the DIRE Coalition's Concern about the Harmful Effects of Nutrients being Released

into the Ocean and their Deleterious Effect on Coral Reef Ecosystems. Looked as a Whole, the Record Underscores the Need for the County to Curtail Injection at the Lahaina Plant as Soon as Possible and to Obtain an NPDES Permit for the Discharges through the Wells into the Ocean.

In our submission dated August 20, 2009, we listed a number of scientific studies, reports, and articles expressing growing concern about increased nutrient loadings spurring algal growth and algal growth's adverse effects on coral reef ecosystems. In this submission, we wish to add the following additional references, reports and articles to supplement the already strong evidence of the existence of a "significant nexus" between the injection wells at Lahaina and the contributions to ocean nutrient loadings, algae growth, and reef ecosystem harm in West Maui that require EPA not to grant the permit as originally requested or as most recently proposed by EPA. The articles included also contain information on the feasibility of safe and beneficial wastewater effluent reuse as an alternative to the injection wells in Hawai'i.

a. **Lau, "WATER REUSE FROM SEWAGE EFFLUENT BY IRRIGATION: A PERSPECTIVE FOR HAWAII,"** ***Water Resources Bulletin*** **(1980) – http://www3.interscience.wiley.com/journal/119607875/abstract?CRETRY=1&SRETRY=0**

"The increasing overall fresh water requirements for the island of Oahu will outstrip the potential yield of fresh ground water sources, as developed by present technology, by the year 2000 according to Honolulu Board of Water Supply projections. There are water shortage regions on other islands. Water reuse from sewage effluent for irrigation will augment natural water resources, furnish supplemental or alternative fertilizer, and reduce ocean water pollution and the costs of engineering systems.

In cooperative field testing from 1971 to 1975, it was demonstrated that effluent can be applied as supplemental water for furrow irrigation of sugarcane without detriment to ground water quality and sugar yield. Studies are in progress to test different dilutions of effluent and its use with chemical ripeners to improve crop yield. Sugarcane plantations on Oahu, Maui, and Kauai are in various stages of water reuse by effluent irrigation. Reuse is presently practiced for irrigation of golf courses and is being planned for forage crops in Hawaii."

b. **USEPA, "Class V Injection Wells Regulatory Amendments," EPA 813-F-95-003 (1995) -- http://www.gwpc.org/e-library/documents/general/UICVEPA.HTM**

". . . aquaculture return flow wells have the potential to influence ground water quality in the vicinity of the point of injection. The potential for serious degradation of ground water quality is mitigated, however, because *the basal ground water flow in coastal Hawaii is usually seaward and the flow of contaminants will likely be away from fresher water inland (i.e., suitable drinking water).*" [Emphasis added]. This citation further underscores and supports the hydro-geology part of demonstrating a "significant nexus" between the points of discharge and receiving ocean waters under Justice Kennedy's test in the Rapanos test and a hydro-geological connection under the Northern California River Watch v. Healdsburg case. It further supports the need for the Lahaina plant to obtain an NPDES permit before any further discharges to and from the injection wells into the ocean.

c. **Paul et al., "'Evidence for Groundwater and surface marine water contamination by wastewater contaminated by waste disposal wells in the Florida Keys," Water Research 31 (6): 1448-1454 (1997) -- http://www.reefrelief.org/coralreef/study/wastewater.html**

"Injection wells (Class V disposal wells) are a major method for domestic wastewater disposal in coastal environments around Florida, and particularly the Florida keys, where there are nearly 700 in operation.

A recent report published in the June issue of Water Research by researchers at the University of South Florida indicates that wastewater disposed by these practices can rapidly contaminate groundwater and surface marine waters.

These investigators, led by Drs. John H. Paul and Joan B. Rose, used harmless bacterial viruses as a tracer for the movement of wastewater from a recently permitted class V disposal well in the Middle Keys.

This well meets current DEP requirements, which means that the well was drilled to 90 feet and cased with PCV pipe to 60 feet. Within 8 hours of addition of the tracer, it was detected in the groundwater, and within 36 hours it was detected in Florida Bay.

By 53 hours, the tracer appeared in a canal on the other side of US1, on its way to Hawk Channel and the Atlantic Ocean.

A second experiment performed last fall indicated that the tracer could move from the waste disposal well to the same canal in less than 8 hours, if strong North winds associated with a cold front occurred at the same time.

The meaning of these results is that wastewater from injection wells can rapidly make its way to the subsurface. This could cause potentially serious health problems for bathers in canals and coastal waters around the Florida Keys.

Disease causing microorganisms could be transmitted from wastewater to these waters where they could potentially infect bathers, windsurfers, jet ski operators and other participants in recreational water-contact activities.

A second reason for concern is the transport of nutrients (inorganic and organic) into marine waters. These act like fertilizers which cause algal growth and water quality deterioration."

d. **West Maui Watershed Advisory Committee, "West Maui Watershed Owners' Manual," (1997) -- http://hi5deposit.com/health/environmental/water/cleanwater/prc/pdf/WestMauiWatershedOwnersManual_bookmarked.pdf**

Among the accomplishments pointed to by the Advisory Committee were: "reductions in nitrogen and phosphorus loadings to Lahaina's wastewater injection wells by over 60%; . . . a new county ordinance on use of reclaimed water; . . . [and] irrigation of Kaanapali Golf Course with 1.3 mgd of reclaimed water." (p. 5)

"A research program was undertaken to investigate the causes of nuisance algal blooms . . . The research confirmed that nutrients from land-based sources are necessary to support the amount of algae growing in West Maui. The major source of nutrients supporting the growth of Hynea is the steady seepage of groundwater along the shore." (p. 5)

While this report reached the conclusion that "Wastewater injection wells were not shown to a significant source of nutrients for Hypnea," this was evidently because "Nutrients from injection wells evidently *enter the ocean* in deeper water than where Hypnea occurs." (p.5 [emphasis added] Thus, the Advisory Committee was acknowledging more than 10 years ago that the effluent from these wells were migrating into the ocean creating an indirect discharge of pollutants to the ocean – a discharge that should have been – but has not been -- regulated under the NPDES permit requirements and other provisions of the Clean Water Act.

e. **NOAA, "THE STATE OF CORAL REEF ECOSYSTEMS OF THE UNITED STATES AND PACIFIC FREELY ASSOCIATED STATES: 2002," – http://www.rmiembassyus.org/Environ/status_coralreef.pdf**

"Two invasive algae, a brown and a green alga (*Hypnea musiformis* and *Cladophora sericea*), are overgrowing reef corals off western Maui." (p. 49). . . For example, secondary treated sewage from urban areas is discharged primarily through deepwater outfalls on O'ahu and through injection wells on Maui and Hawai'i (Kona District). Nutrient leaching from injection wells on Maui is attributed to the algal blooms occurring there." (p. 63)

f. **NOAA, "A National Coral Reef Action Strategy: Report to Congress on Implementation of the Coral Reef Conservation Act of 2000 and the National Action Plan to Conserve Coral Reefs in 2002-2003," pp 1-156 (2002) -- http://coris.noaa.gov/activities/actionstrategy/action_reef_final.pdf**

"Coral reefs are some of the most biologically rich and economically valuable ecosystems on Earth. They are also in serious jeopardy, threatened by an increasing array of impacts from overexploitation, pollution, habitat loss, invasive species, diseases, and climate change. The rapid decline and loss of these valuable marine ecosystems has significant social, economic, and environmental consequences in the U.S. and around the world. Action is needed on a wide variety of fronts to address the coral reef crisis, especially on issues of global proportions such as the impacts of climate change, increasing coastal development and persistent over-fishing of reef systems.

The Report lists 2 fundamental themes and 13 goals which are "essential to addressing and reducing threats to coral reefs worldwide." Those themes and goals include:

- **"THEME 2: Reduce The Adverse Impacts Of Human Activities** – Reducing the impacts of human activities is essential to conserving coral reef ecosystems. The strategy outlines the following major goals to reduce the adverse impacts of human activities: . . .
  - *Goal 8: Reduce pollution"* (pp. iii-iv)

"The following goal or action areas were ranked as high priority needs by all or most U.S. regions: . . . – "Reduce pollution (reduce sediment pollution) . . . " [among others] (p. 13).

"Land-based pollution is the major cause of coral reef loss and degradation in many coral reef ecosystems world-wide (Bryant et al., 1998). Coral reef ecosystems need clean, clear water and healthy habitats, both of which can be imperiled by pollution. Many coral reef ecosystems are currently impacted by a variety of pollutants, including sedimentation, *nutrients*, chemical contaminants, marine debris, and invasive, non-native species (biological pollutants). Pollution enters reef ecosystems in many ways, ranging from specific point sources such as sewage pipes and vessel discharges, to more diffuse runoff from land based sources such as agriculture, coastal development, road construction, and on-site waste water management systems, to airborne sources such as emissions from automobiles and power plants. . . . [Emphasis added]

"Conserving the Nation's coral reef ecosystems requires reductions in the concentrations and cumulative impacts of pollution from a variety of sources. . . . Excess nutrient loading from inadequate treatment and disposal of human and animal waste, and surface runoff from urban and agricultural lands, can also lead to significant changes and damage to the reef community. . . . The goal is to reduce the quantity and impacts of sediment, *nutrient*, marine debris, and biological pollutants (e.g., invasive species) on coral reef ecosystems." [Emphasis added]

"The strategy has two main parts divided into seven objectives: (1) developing tools to assess the biological, chemical, and physical conditions of coral reef ecosystems, and (2) reducing the major types of pollution impacting coral reef ecosystems. . . . Objective 2: Reduce nutrient pollution by establishing comprehensive waste management systems to reduce discharges of harmful pollutants from wastewater treatment facilities, vessels, industrial sources, agricultural sources and air deposition. (pp. 60-61)

"IMPLEMENTATION PLAN 2002-2003 . . . To Address Objective 2: . . . Conduct assessment of nutrient pollution issues in reef-associated coastal watersheds to help identify priorities and strategy of action in each region." (p. 65)

See Table 3, listing "reducing nutrient pollution" as a "high priority" for the Main Hawaiian Islands. (p. 100)

g. **Schrope, "Changes in Reef Latitude," NASA Earth Observatory, Feb. 2006 – http://earthobservatory.nasa.gov/Newsroom/view.php?id=29573**

"Since the 1980s, researchers have hypothesized that nutrient levels rather than temperature are the main factor controlling the latitudinal bounds of coral reefs, but the issue remains controversial. New results from an extensive survey of reefs in South Florida by a Harbor Branch Oceanographic Institution research team strongly support this hypothesis. The research suggests that, by supporting blooms of harmful seaweed, increasing nutrient pollution levels are reducing the areas where reef-building coral can survive, a result the team believes it is directly observing in Florida waters. . . . Temperature is a key determinant of the extent of shallow water reefs. Nonetheless, some waters that are warm enough for reef building corals do not have them. In Florida, for instance, reef-building corals are for the most part not found north of Palm Beach County, about a third of the way up the coast. This boundary appears to have been similar throughout the state's geological history, yet corals thrive in Bermuda, well north of there where temperatures are cooler.

One idea is that, both historically and now, this Florida coral cut-off has been determined by nutrient levels. Corals' need for oligotrophic, or nutrient poor, water is well known, but the relative importance of temperature and nutrients in defining coral range can be difficult to discern. Lapointe believes, based on more than 20 years of research at reefs in Florida and the Caribbean, that levels of the nutrient phosphorus can be a key factor controlling growth of reef-building corals. The basic theory is that in the presence of sufficient nitrogen, which is typically more readily available, phosphorus is the limiting factor for macroalgae, or seaweed, growth, so high phosphorus levels can fuel the growth of seaweed that outcompetes corals, effectively smothering them.

As they do now, sediments rich in phosphorus historically dominated Florida's central and northern coastal areas above the Palm Beach County line. In the past, Lapointe says, naturally high levels of phosphorus would have set the northern coral boundary in Florida above which seaweed is dominant. Further south, the sediments are predominately carbonates, which react with phosphorus to significantly reduce levels of the nutrient in the water. . . .

Supporting the theory that nutrient levels control the latitudinal boundaries of coral reefs, the team has found a clear increase from south to north in the concentration of phosphorus in forms that can be used by the seaweed and a corresponding expansion of fleshy seaweeds. They also found a complementary decrease in the number of species and extent of coral and reef fishes from south to north. These data were corroborated by analysis of tissue for the dominant seaweed species at each location, which, again, revealed less phosphorus at southern sites and more to the north.

These gradients were much more pronounced during the wet season compared to the dry season, suggesting a significant role for non-point source and other forms of nutrient-rich pollution in controlling nutrient dynamics at the reefs. Lapointe's group has also completed extensive analyses of the chemical signature of nitrogen stable isotopes in seaweed samples and determined that the algae are using mainly nitrogen from land-based sources, rather than from marine sources, further suggesting a tie to human activities.

Sufficient nutrient levels, and associated seaweed growth, can effectively cause near or total loss of reef-building corals. . . .

"Certainly it appears that factors such as global warming leading to coral bleaching are having significant impacts, but I think it's a mistake to blame all the devastation we've witnessed in past decades on global factors. Local nutrient pollution problems can be addressed and if we do that, I think it's clear that corals will strongly benefit."

h. **Richmond et al, "Watersheds and Coral Reefs: Conservation Science, Policy, and Implementation,"** ***Bioscience*****, (July-Aug. 2007), pp. 598-607 -- http://www.kewalo.hawaii.edu/labs/richmond/assets/Publications/Richmond%20et%20al%3B%20Bioscience%20%282007%29.pdf**

"Coral reefs in the United States and throughout the world are experiencing documented declines in ecosystem health, integrity, and resilience (Wilkinson 2004). . . .

"The presence of multiple stressors often leads to finger-pointing among a variety of users, all defending their own activities while accusing others of culpability; hence, there is a need not only for data that clearly identify cause-and-effect relationships (Downs et al. 2005) but also for improved policy development, implementation, and enforcement.

"In the face of uncertainty, manufactured or real, policymakers often choose inactivity by default rather than subscribe to the precautionary principle. This approach undermines society's ability to leave a sound environmental legacy for future generations.

"There is a broad consensus that coral reefs throughout the world have been and continue to be degraded by a variety of human activities (Hughes et al. 2003,Pandolfi et al. 2003, 2005).Runoff, sedimentation, and land-based sources of pollution within adjacent watersheds are among the greatest threats to coastal coral reefs surrounding high islands and along continental margins. While there are numerous efforts under way to address coral reef decline, few positive examples exist that document efforts where science, policy, and management have intersected successfully to reverse the present trend.

". . . many Pacific island cultures treat the land–sea interface as a continuum rather than a boundary, and this "ridge-to-reef" stewardship recognizes that upslope activities affect people and resources farther down a watershed and in the ocean.

" The main US coral reef ecosystems—in the states of Hawaii, Florida, and Texas; the commonwealths of the Northern Mariana Islands and Puerto Rico; and the territories of American Samoa, Guam, and the US Virgin Islands—have all suffered substantial degradation from land-based sources of pollution and sediment stress. Development within watersheds, the channelization of streams for flood control projects, and other poor land-use practices have turned coastal waters into dumping grounds for runoff, and thus for substances ranging from nutrients to toxic chemicals. Such chronic stressors of increasing magnitude act synergistically when superimposed over natural cycles of coral reef disturbance, and often prevent cycles of recovery that would occur in the absence of the anthropogenic signal.

The history of environmental remediation, from cleaning up polluted Superfund sites to addressing harmful algal blooms associated with anthropogenic eutrophication of coastal waters, demonstrates that prevention of environmental degradation is more cost- and time-effective to society than remediation after the fact. While coral reef restoration activities are conceptually attractive, proactive and protective measures are essential, given the magnitude of coral reef damage, the complexity of coral reef ecological structure and function, and the fact that a 300-year-old coral can be killed in hours to weeks, but cannot be replaced for centuries (Richmond 2005)."

i. **Meghan Dailer, Testimony before Water Resources Committee, Maui County Council, December 1, 2008 -- http://www.co.maui.hi.us/archives/111/081201min.pdf**

"Underground sewage injection wells also contribute to nutrient, nutrient loading on Maui. Up to five *[sic]* million gallons of sewage effluent a day are injected into the ground in three areas of wastewater treatment plants on Maui: Kahului, Kihei and Lahaina or North Kaanapali Beach. . . . the sewage effluent coming out of this injection wells and such are high with N15 values. . . . Since Nitrogen is often limiting in the marine environment, macroalgae will utilize Nitrogen

from additional sources, such as land based fertilizers and sewage effluent when available. The N15 values of macroalgae growing directly in front of sewage outfalls are often highly enriched, with values generally ranging in the literature from 9 to 15. . . .

This is a study by Costanzo et al in 2001 in Australia. This figure is showing the loads from sewage outfall sites of Nitrogen in tonnes per year. Oh, sorry. This is the associated N15 values from similar places. So, the values in the red circles are from areas 'in close proximity' to sewage outfall sites and they have higher N15 values than those in the green circles, which are not anywhere near a sewage outfall site. This and, this and many other studies have successfully linked the elevated N15 values in macroalgae to the presence of sewage effluent in the marine environment. . . . Heavy N15 signatures, meaning 18 and above are in the orange and red circles, and correspond to areas with sewage injection wells in Kahului, Kihei, and Lahaina, or North Kaanapali, which shows that the injected reclaimed water is percolating into the near shore marine environment.

Since the Maui coastline study was able to successfully detect areas of concern due to the presence of elevated N15 values, we conducted another survey in May to map the injection well plumes from the Lahaina and Kihei Wastewater Treatment Plants. These maps show the collection sites for the Lahaina injection well plume. The previous N15 values of 43 and 35 are also displayed. The N15 of . . . and the N15 value of 43 is currently the highest known macroalgal N15 value in the literature.

At Kahekili Beach Park and .5 kilometers to the north, the shallow fore reef area harbors . . . has algae blooms in the summers when the large north swells are no longer persistent and the south swells are fewer and farther between. . . .

In closing, some of our important findings so far are that on Maui, the most elevated, elevated macroalgal N15 values are in close proximity to sewage injection wells. Ulva and hypnea grow faster with the nutrient mixture in sewage effluent than without nutrients. . . . From these experiments it is clear that algal blooms on Maui of hypnea and ulva are driven by an excess of land based nutrients." (pp. 6-15)

"Although the causes are not completely understood, there is compelling evidence that nutrient enrichment (nitrogen, phosphorus, iron) of coastal waters is at least partly to blame for such [algal] blooms. [Vitousek, et. al, 1997]. . . . In coastal waters, the most important nutrients are nitrogen and phosphorus. . . . Human-introduced sources of these nutrients include sewage, fertilizer, and soils originating in the coastal watershed." (pp. 67-68).

"During these [algal] blooms [of the early 1990s] the Cladophora drifted inshore where it settled in dense masses on the ocean floor, apparently smothering corals and other reef organisms." (p. 70).

"Separate studies . . . attempted to find the plume of wastewater immediately offshore of the Facility at Honokowai [but] the investigators never discovered the plume's exact location. . . . [Despite this the investigators concluded definitively that] "there is no major 'plume' of effluent seeping into the ocean within the study area." (p. 74)

"The amount of nutrients and sediment reaching the ocean [has] been reduced. Improvements in sewage treatment and the irrigation of the Kaanapali Golf Course have cut nitrogen loads to sewage injection wells by over 60%." (p. 76)

This study further demonstrates the connection between the algae blooms and the excess nutrients resulting from land based sewage pollution (including the injection wells at Lahaina) and the resultant harm to the coral reefs.

j. **Maui Planning Commission, Hearing, Feb. 26, 2008 -- http://www.co.maui.hi.us/archives/85/022608.min.pdf**

"Mr. Starr. . . . in your previous testimony you described how basically, you know, in this system everything ultimately flows from the mountain to the sea. That there's a shoreward flow of water and that the injection products being injected into the injection wells will travel toward the ocean. They certainly wouldn't be flowing upslope into the mountain and I'm trying to understand how long it will take for that flow to travel from the location of the injection wells to when it is underneath the ocean.
Mr. Starr: Will it flow toward the ocean or will it flow up the mountain?
Mr. Krock: Nothing flows up the mountain.
Mr. Starr: Will it flow inland or will it flow toward the ocean?
Mr. Krock: That particular thing will flow very little but it will generally, the tendency would be towards the land.
Mr. Starr: It's flowing toward the land? Mr. Bauer do you concur that the effluent from this injection well will flow toward the land because I know that the plumes from the county injection wells have all been traced and they all flow toward the ocean. In fact, every well that ever has been put injection in Hawaii always flows toward the ocean. Are you willing to state your reputation and future on saying that the injected water will flow uphill toward the land mass?
Mr. Bauer: The return water will flow in all directions because it's being pumped down the well and into permeable zones. Permeable zones are essentially horizontal. So you can imagine the water moving in all directions. So some of it is going inland and some of it is going to towards the ocean –
. . .
Mr. Starr: Okay, so some of it will flow toward the ocean?
Mr. Bauer: Some of it will flow towards the ocean.
Mr. Starr: How long will it take it – at what rate will it travel that which travels toward the ocean?
Mr. Bauer: I don't know what rate it is until we have the information on pump testing and what kind of permeability we're looking at. But it will be flowing, it will be moving and you know, maybe few feet per day, maybe less." (pp. 45-46)
. . .

Mr. Starr: I share your concern about the limu and the algae growth, you know, in their report they say the reef is just fine out there, but it's dead. It's dead, over the last 30 years I've been snorkeling that place and the reef is dead and now we've got seaweed and algae. We have a project before us that's going to have injection wells right behind the shoreline. They're going to put hot brine down into the beach and no one knows what that's going to do and it possibly could make the algae growth and the limu growth to exponential. Isn't that something that would be concern you or do you think that's okay because it's already so trashed?
Mr. Lindsey: No, it's not okay. And I appreciate your concern. That was my concern too. (pp. 83-84).
. . .

This exchange further underscores the seaward direction of groundwater flow and injection well plumes in the vicinity of West Maui and documents the decline of the coral reefs as the algae has grown.

k. **Knowlton and Jackson, "Shifting Baselines, Local Impacts, and Global Change on Coral Reefs," PLOS Biology (2008) -- http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.0060054**

" , , , over the past few decades . . . living coral cover has decreased on average by one-third to more than two-thirds worldwide. . . .

"There is, however, every reason to believe that the extent of local impacts may affect the responses of corals and other reef organisms to global change. . . . Global changes, most importantly warming and acidification, have already occurred and will continue, even under the most optimistic of scenarios, so that conservation strategies must be evaluated accordingly. . . . Of particular importance are the effects of resource extraction and lowered water quality on reef ecosystems and their effects on corals via overgrowth of macroalgae and disease. . . .

". . . low abundance of corals and coralline algae is almost invariably associated with high abundance of fleshy or turf macroalgae. The causes are complex because so many interacting factors, including overfishing, pollution, and warming, can kill corals directly as well as promote growth of macroalgae that can also kill corals directly by overgrowth or indirectly by promoting coral disease. . . .

"The best-understood aspects of coral resistance and resilience relate to the effects of overfishing, degraded water quality, and increased macroalgal abundance on coral recruitment (resilience) and coral disease (resistance). Many corals require hard substrates (and in particular, coralline algae) to recruit, and the relationship between recruitment failure and increasing macroalgal dominance due to loss of herbivory, and the converse, are well documented . . . Large amounts of macroalgae may also destabilize microbial communities . . . either by changing water chemistry near coral surfaces . . . or by serving as a reservoir for pathogens . . . High anthropogenically derived nutrient levels could also simultaneously increase macroalgae and disease. . .

"New insights in science often come from examining the exceptions to general patterns rather than the norms. The remote, uninhabited atolls of the Central Pacific are a case in point and cause for cautious optimism. Despite increased warming and coral bleaching throughout the Pacific, these reefs still support extraordinarily abundant fish populations dominated by apex predators and among the highest reported abundances of living coral and coralline algae. . . . [R]egardless of the ultimate explanation, the simple persistence of these luxuriant reefs is fundamentally inconsistent with the growing belief that the effects of global change are so overwhelming that other factors can be largely ignored.

"There is, however, no room for complacency. Most reefs are not yet as degraded as cattle ranches in the Amazon, but they are poised at the brink . . . . Very small numbers of people can have a big impact on trophic structure . . . and ecosystem resistance and resilience, which may

degrade much faster than biodiversity. Figure 2 illustrates the inferred relationships between the intensity of local anthropogenic disturbance and biodiversity and ecosystem function based on the studies reviewed in this essay. . . .

In sum, local actions do make a difference, not only to fishes, but also to reef ecosystems as a whole, and they do so across the entire spectrum of local human impacts and oceanographic conditions where reefs occur."

This article makes clear the urgency and importance of taking action at a local level to reduce land-based nutrient flow to coral reef ecosystems in light of the likely continuation of challenges to the reefs from global climate change.

l. **Kauai County, "Building Public Facilities and Services," -- http://www.kauai.gov/Portals/0/Planning/Ch7.PDF, p. 19)**

The potential for ocean pollution from wastewater injection wells near the ocean has been recognized and acknowledged on Kauai since 1993: "The *Water Quality Management Plan for the County of Kauai* (November 1993) discusses the need to create a regional system serving Köloa Town, which has subsurface disposal problems, and Poipü, where smaller visitor properties and residences are currently served by a variety of small private plants. Because these plants dispose of effluent by ground injection, there is a long-term risk of polluting adjacent ocean waters." (p. 19)

This statement from Kauai County makes clear that County's long-standing awareness of the nexus between injection wells near the ocean and resulting harmful pollution of the ocean.

m. **Fore et al., "Heeding a call to action for US coral reefs: The untapped potential of the Clean Water Act," *Marine Pollution Bulletin* (2009), pp 1-2 -- http://webmail.kelaassociates.com/horde/imp/view.php?thismailbox=INBOX&index=10859&id=2&actionID=113&mime=338e8c6936040a2e66e201136eebcd93**

This article endorses "the 'bold and urgent steps' outlined by Dodge et al. (2008) and propose[s] that the CWA can be used to advance all nine actions (Fore et al., 2008)." These nine actions include: . . . (8) Recognize the links between what we do on land and how it affects the ocean. Most sediment and nutrients and a large share of toxic chemicals that affect coral reefs originate on land and are transported to near shore environments by rivers, streams and stormwater systems. Moreover, water withdrawal and other activities that alter the flow of freshwater to coastal environments originate with human land use. The CWA has authority over freshwater and estuarine environments and states and territories are required to monitor and regulate their condition. Biological criteria in nearshore environments can potentially be linked to physical, chemical, and biological criteria in rivers, wetlands and estuaries, providing a direct connection to land-based sources of pollution."

8. On the current record considered as a whole, it would be "arbitrary, capricious, an abuse of discretion, or not otherwise in accordance with law" for EPA to grant a 10 year permit for continued injection of wastewater effluent at the Lahaina Wastewater Treatment Plant, to allow high levels of nutrient to

continue to flow into the wells and into the oceans, and to fail to insist on the County obtaining an NPDES permit for the discharges through the wells into the ocean. The Mayor's Testimony at the August 20 Hearing In Favor of Ending Injection Wells as Soon as Possible and Reusing the Water Means That a 10-Year Open-Ended Permit to Continue to Inject at Current Levels Underscores This Point.

Under the Administrative Procedure Act (APA), courts will set aside agency decisions found to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706 (2) (A). As the Supreme Court has explained: "The scope of review under the 'arbitrary and capricious' standard is narrow and a court is not to substitute its judgment for that of the agency. Nevertheless, the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983). Agency action is arbitrary and capricious "if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, *offered an explanation for its decision that runs counter to the evidence before the agency*, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." Id. [Emphasis added]

The record as a whole is clear: the County of Maui has failed to bear its burden of proof by a preponderance of the evidence that it is entitled to a 10 year extension of the permit to inject wastewater effluent at the Lahaina (Honokawai) treatment plant. It has failed to demonstrate a need for ten more years. The dangers of 10 more years of injecting algae fueling nutrients into the wells have been powerfully documented in the record as has the actual release of these nutrients into the ocean from the wells. The public and experts in this field have unanimously urged the Agency not to grant 10 more years to inject wastewater effluent at Lahaina. The decision of the Agency cannot "run counter to the evidence before it" without being considered "arbitrary, capricious, and/or an abuse of discretion." It is clear that even in the area of enforcement discretion, "the [EPA] Region's discretion in this regard is not unconstrained." In re Borough of Ridgway, PA, USEPA Board of Appeals, Clean Water Act Appeal No 95-2 (1996), p. 494 http://www.epa.gov/eab/disk9/ridgway.pdf

It is clear that the Agency must make its decisions on the basis of the record before it, including its response to all salient comments. "The idea behind the regulations at 40 C.F.R. §§ 124.17 and124.18 [UIC regulations] is that the *decision maker* have the benefit of the comments and the response thereto to inform his or her permit decision. Held: In order to effectuate the requirements of 40 C.F.R. §§ 124.17 and 124.18, the Board hereby vacates the permit decision and remands this case to the Region for the purpose of requiring the Region to reconsider and reissue a final permit decision, based on the administrative record." In re Weber #4-8, UIC Appeal No. 03-01 (2003), p. 241 -- http://www.epa.gov/eab/disk11/weber.pdf

> … the Regional Administrator must base the final permit decision on the administrative record, which must be "complete" on the date he or she issues the final permit. . . . § 124.18. These requirements ensure that the decision maker gives serious consideration to comments before or at the time of making his or her final permit decision. *See In re Rockgen Energy*

Ctr., 8 E.A.D. 536, 556 (EAB 1999); *In re Atochem N. Am., Inc.*, 3 E.A.D. 498, 499 (Adm'r 1991). Id at p. 246.

Nor may the Agency grant a UIC permit which it knows will sanction behavior that violates another law it administers – in this case the prohibition against point source discharge of pollutants into the ocean without an NPDES permit – albeit through an underground conduit. Once the County and EPA know that the injection wells have been and are releasing their contents into the ocean, the Clean Water Act prohibition is triggered. See In re Service Oil Co, CWA Appeal No. 07-02, USEPA Environmental Appeals Board, (2008), pp 4-5. For EPA to authorize such conduct for 10 more years through a UIC permit without requiring the County to obtain an NPDES permit would be "otherwise not in accordance with law" in under 5 USC 706 (2) (A).

It is clear that EPA Regions may go beyond considerations of compliance with the Safe Drinking Water Act when the issues raised with a pending UIC permit – as here – involve allegations that the injection well is (or would) cause a violation of the Executive Order, other law or policy administered by EPA. See, for example, In re EDS, US Environmental Appeals Board, 98-1 and 98-2 (1998), pp. 35-36, in which Region V considered whether a proposed injection well would violate the Environmental Justice policies of the Agency as reflected in draft guidelines of the Region and an Executive Order – EO 12898. As noted above in Point 1 of these Supplemental Comments, EO 13089 includes requirements that must be observed for maximizing protection of coral reef ecosystems before federal agencies take any action (such as granting an UIC permit) that may "affect coral reef ecosystems." Thus, it is not only perfectly appropriate, even obligatory, for Region 9 to impose terms and add conditions to the permit such as we have advocated to protect the coral reef ecosystems in West Maui. By the same token, it would be arbitrary, capricious, an abuse of discretion, and not otherwise in accordance with law if Region 9 were to refuse to do so.

See also In re Rentkiewicz, UIC Appeal 91-4 (1992), p. 65, in which the Environmental Appeals Board remanded an UIC permit to the Region because of failure to deal adequately with concerns expressed about the potential harm to Endangered Species from the injection well being permitted. http://www.epa.gov/eab/disk1/renki.pdf

The cases in which EPA has refused to impose terms or conditions on UIC permits requested by opponents of the permit and in which the Environmental Appeals Board has upheld that refusal (or denied review) involve situations that do not present "clear factual or legal error affecting the Region's permit decision, nor any important policy matter or exercise of discretion warranting review by the Board." In re Federated Oil and Gas of Traverse City Michigan, UIC Appeal No. 95-38, US Environmental Board of Appeals (1997), pp. 724-25. Such is not the case with respect to the pending Lahaina permit. In this case, if the Regional Administrator were to grant the 10 year permit request of the County on this record and in disregard of the Regional Administrator's duties under the various authorities cited here and in previous submissions, that decision would raise very clear factual and legal issues and call into question the reasonableness of the exercise of discretion in support of such decision.

These considerations strongly dictate in favor of the Region restricting the permit to the shortest possible time necessary to transition to a safe wastewater reuse plan that has been called for not only by the DIRE Coalition, but now by the Mayor of Maui County herself; restricting nutrient

loadings into the wells and oceans more stringently, and insisting on the County obtaining and abiding by an NPDES permit.

9. The Lahaina News Has Editorialized "Get Rid of Injection Wells"

We request that this editorial – at http://lahainanews.com/page/content.detail/id/500110/Get-rid-of-injection-wells.html?nav=9 – be added to the record and considered by EPA when making its decision on the pending application for the permit at Lahaina. See Appendix 1

Public testimony and written record submissions – over 200 of them – have been unanimous as well – in opposing the granting of a 10 year permit and in favor of more stringent limits on effluent and nutrient loadings to be allowed into the wells in the interim before the wells are shut down.

Appendix 1 – "Get Rid of Injection Wells"
Lahaina News Editorial – August 27, 2009

"Every day, an average of 3,000,000 to 5,000,000 gallons of treated sewage is dumped into the ground at the Lahaina Wastewater Reclamation Facility, and one million gallons is treated to R-1 quality and reused.

Add that up for years, and you have billions of gallons of nutrient-rich effluent marching toward the ocean.

With injection wells in use around the island, this practice is foolish on several levels.

The treated wastewater pollutes the ocean, harms reefs and the nearshore environment and fuels algae blooms.

Meanwhile, precious potable water is used to irrigate golf courses, parks, resorts and other large properties, while drinking water sources are taxed and quality declines.

In reviewing the injection well permit for the Lahaina Wastewater Reclamation Facility, the U.S. Environmental Protection Agency was ready to let the county keep wasting water for the next ten years to the tune of 7,000,000 gallons per week at the stinky Honokowai plant.

Responding to public concerns, Mayor Charmaine Tavares told EPA the county wants to end its use of injection wells and pursue 100 percent reuse of treated wastewater in conjunction with a pilot project to grow algae for fuel production.

Her administration will create a plan to meet that goal within the next 12 to 18 months, and begin implementing the plan within five years to cut down use of the wells.

“We should first explore what options are available; second, analyze the options considering costs, time and other factors; and third, set volume reduction targets — then we will be on a positive path to accomplishing the goal of 100 percent use of reclaimed wastewater,” Tavares explained in a letter to the DIRE (Don’t Inject Redirect) Coalition last week Wednesday.

“I do not wish to be perceived as just ‘another politician’ making promises someone else will have to keep. I do want to put us on a course to complete projects that will increase use of reclaimed water.”

Mahalo to the many residents and scientists who spoke out on injection wells. It’s clear EPA and the Hawaii Department of Health are clueless on the hazards of injection wells, or these agencies would have taken meaningful action 20 years ago.

Also credit Mayor Tavares for taking steps to protect water resources and halt ocean pollution. Her initiatives for environmental protection and alternative energy have been creative and smart.”