Council File 13-1300-S5

January 16, 2013
Los Angeles City Council
City Hall
200 North Spring Street
Los Angeles, CA 90012

City Council Agenda Item 34

Honorable Council Chair, Council Members,

My name is James Shaw and I am the director of the Union for Medical Cannabis Patients. We are not UFCW, ASA, GLACA, Pre-ICO, Post-ICO, or any other label except committed to the betterment of humanity toward the wise regulation of medical cannabis.

Once again, I speak to you for the public record, of the two pieces of regulation we submitted on October 3, 2012, that make up one amazing ordinance, that is lawsuit-proof, needs no CEQA review, promotes patient organizations to provide extensive non-cannabis services to their members including addiction counseling and benefits to the local community, requires patient organizations to track every gram of medicine to prove that none is getting to the black market or in the hands of youth, and gives natural tax mechanisms that allow Cities to benefit without preemption issues.

We have always been a small organization representing barely over 10,000 patients and their organizations. But our voice is an important one and if listened to could end the challenges you have faced over the years and will continue to face with the folly that ensues from ordinances like the various ones currently headed toward the ballot. As Albert Einstein said, "The problems that exist in the world today cannot be solved by the level of thinking that created them."

Our ordinance would help the City with the issues we have been facing and promote the kind of patient organizations that would clearly be a benefit to society. I urge you to make a bold move, and replace what the City Attorney has offered you with our solution and put our ordinance on the ballot.

It is my prayer that someone will hear my offer, read what we have written, ask about where they don't understand, and enjoy the fruits of a labor of love.

On a separate but related note, we have provided you warning on every occasion of the challenges posed to the environment of decreasing the number of patient organizations through your ordinance process. Again we submit to you notice of the necessity of CEQA review especially in light of the current ordinance's disregard of those patient communities who have had to shut down and are attempting to relocate based on the federal intervention you invited to Los Angeles.

James Shaw,
Director
Union for Medical Cannabis Patients

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

January 16, 2013

VIA PERSONAL DELIVERY

Council President Wesson and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Spring Street, Room 340
Los Angeles, CA 90012

Re: Council File 11-1737-S4 and 13-1300-S5 re Los Angeles Medical Marijuana 'Limited Immunity Ordinance; Compliance with California Environmental Quality Act

Dear President Wesson and Council Members:

This firm represents the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed adoption of a "Limited Immunity Ordinance" ("LIO" or "Ordinance") regulating medical marijuana collectives. For the reasons outlined below, the Ordinance is not exempt from the California Environmental Quality Act ("CEQA") and the City must prepare an Initial Study and give the public an opportunity to comment before it can submit the Ordinance to the people for a referendary vote.

Placing the Ordinance on the Ballot Does Not Exempt the City from CEQA Compliance

Referendums such as the LIO are not exempt from CEQA. In *Friends of Sierra Madre v. Sierra Madre (2001) 25 Cal. 4th 165* the Supreme Court held that referenda that originate from the actions of a public agency are subject to CEQA. In *Sierra Madre*, the court stated the following: "We conclude, therefore, that initiative measures generated and placed on the ballot by a public agency are not exempt from CEQA. Before placing any such measure that may lead to voter approval of a project on the ballot, the agency must comply with CEQA. If compliance leads to the preparation and consideration of an EIR, when that process is final the information contained in the EIR must be made available to the electorate for its consideration prior to the election." *Friends of Sierra Madre v. Sierra Madre (2001) 25 Cal. 4th 165, 191.* The LIO was authored by the City and is now proposed to be placed on the ballot by the City. As such, the City must comply with CEQA before placing the

Ordinance on the ballot. The City is compelled to prepare an Initial Study pursuant to §15063 of the California Public Resources Code as outlined below:

The LIO is Not Exempt from the California Environmental Quality Act

UMMP and ADHC have submitted previous letters to the City explaining that the City's proposed medical marijuana ordinances were not exempt from CEQA. Indeed, letters were submitted on the following dates:

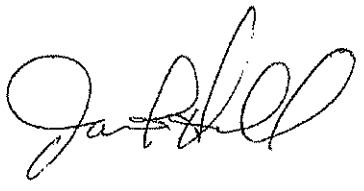
- Letter dated January 14, 2011 (Exhibit No. 1)
- Letter dated January 21, 2011 (Exhibit No. 2)
- Letter dated June 8, 2012 (Exhibit No. 3)
- Letter dated June 8, 2012 (Exhibit No. 4)
- Letter dated June 21, 2012 (Exhibit No. 5)

The LIO contains many of the same provisions as the previous ordinances considered by the City (including, for example, relocations, closures, and capping the overall number of collectives in the City). Therefore, the LIO is not exempt from CEQA. As such, the City is compelled to analyze whether the proposed project will result in any "significant, adverse effects on the environment" by conducting an Initial Study before placing the LIO on the ballot.

Conclusion

A fair argument has been outlined in the attached letters regarding the significant environmental effects of the LIO. As such, the City must conduct an Initial Study under CEQA and provide the public with a review period to comply with the legal mandates of CEQA.

Sincerely,



Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

Exhibit 1

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

January 14, 2011

VIA PERSONAL DELIVERY

Council President Garcetti and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Sprint Street, Room 340
Los Angeles, CA 90012

Re: Council File 08-0923-S7 re Los Angeles Medical Marijuana Ordinance; Compliance with California Environmental Quality Act

Dear President Garcetti and Council members

This firm represents the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed amendment of Ordinance No. 181069 ("amended ordinance"). I understand that the City will be discussing the amended ordinance (which has yet to be released to the public) on January 14th and is poised to discuss "whether adoption of the ordinance is exempt from the California Environmental Quality Act" ("CEQA"). For the reasons outlined below, the amended ordinance is not exempt from CEQA and the City must prepare an Initial Study and give the public an opportunity to comment prior to adoption.

The Amended Ordinance is Not Exempt from the California Environmental Quality Act

Under CEQA, the City is compelled to analyze whether the proposed project will result in any "significant, adverse effects on the environment." Regardless of the City's asserted position regarding the legality of the hundreds of existing medical marijuana collectives in the City, the fact remains that medical marijuana collectives have existed in the City for at least 5 years. This is the environmental baseline and status quo. Ordinance No. 181069 sought to uproot established collectives and relocate them to other parts of the City and new Community Planning Areas ("CPAs"). According to the City's own records, only a handful of collectives would have met Ordinance 181069's buffer zone requirements such that they were not forced to relocate. If the City chooses to adopt a similar regulatory regime that compels the mass relocation of hundreds of existing collectives, then they must

review this action under CEQA. Moreover, any grandfather date that effectively reduces the number of collectives in the City will certainly change the environmental status quo by reducing the total number of collectives and access to medical marijuana. Patients have come to depend on the existing locations in the City. An amended ordinance that results in mass relocation or the reduction in the total number of existing collectives will result in a physical change in the environment and requires review under CEQA. This impact is not speculative and is certainly foreseeable.

The City is compelled to prepare an Initial Study pursuant to §15063 of the California Public Resources Code as there are no applicable exemptions established in Division 13, Articles 18 or 19 of the California Public Resources Code.

Any Initial Study conducted by the City must analyze the reasonably foreseeable indirect or secondary effects of the amended ordinance. The term "project" as defined in Cal. Pub. Res. Code § 21065 has been broadly interpreted by courts. For example, in a seminal case decided by the California Supreme Court, the court stated that CEQA is "to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259. Further courts have concluded that the term "project" encompasses regulatory approvals such as general plan amendments, zone changes, and annexations which may ultimately lead to physical environmental changes. 14 Cal. Code Regs. § 15378(a)(1); *Bozung v. Local Agency Formation Commission*, (1975) 13 Cal. 3d 263, 277 n.16, 118 Cal. Rptr. 249. The City is required under CEQA to undertake a review of an ordinance when it is apparent that the regulations will "*culminate* in physical change to the environment." *Bozung v. Local Agency Formation Commission*, 13 Cal. 3d 263, 281 (emphasis added).

The fact that the "project" at issue is the adoption of an ordinance as opposed to a development project proposed by an applicant does not relieve the City of the obligation to undertake a review of the project under CEQA. *Rosenthal v. Board of Supervisors* (1975) 14 Cal.App.3d 815, 823 (stating that "adopting an ordinance [is] a project"); *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 118 Cal.Rptr. 34 (impliedly holding that adoption of ordinance is a project within the meaning of CEQA); 60 Ops.Cal.Atty.Gen. 335 (1977) ("ordinances and resolutions adopted by a local agency are 'projects' within the meaning of CEQA"). The Attorney General Opinion issued in 1977 concluded that the following ordinances were all subject to CEQA: (1) an open-range ordinance requiring private land owners to fence out cattle; (2) an ordinance allowing construction of single family dwellings in rural areas without electricity, running water, or flush toilets; and (3) an ordinance modifying road improvement standards for new subdivisions. The bottom line is that a project need not directly effect a physical change in the environment: reasonably foreseeable indirect or secondary effects must also be analyzed. The relative inquiry is whether or not the project, or in this case, the amended ordinance, will ultimately culminate in physical changes to the environment. *Id.* As described below, the City's amended ordinance will unquestionably culminate in a physical change to the environment and an Initial Study that the City conducts must analyze these impacts before the City can adopt the amended ordinance.

The environmental impacts of the amended ordinance could be profound. The environmental factors that the City is compelled to consider include the following: (1) Aesthetics, (2) Agriculture and Forestry, (3) Air Quality, (4) Biological Resources, (5) Cultural Resources, (6) Geology / Soils, (7) Greenhouse Gas Emissions, (8) Hazards & Hazardous Materials, (9) Hydrology / Water Quality, (10)

Land Use / Planning, (11) Mineral Resources, (12) Noise, (13) Population / Housing, (14) Public Services, (15) Recreation, (16) Transportation/Traffic, and (17) Utilities / Service Systems. While the amended ordinance may not have a significant effect on the environment with respect to one particular environmental factor (e.g. Mineral Resources), it may nonetheless have a significant environmental effect on another factor (e.g. Transportation / Traffic). Without conducting an Initial Study, the City has no way of knowing the effects on the environment. Here are some facts to consider:

- Ordinance 181069 only allowed those collectives that successfully registered with the City on or before November 13, 2007 to continue to operate in the City.
- Based on the City's estimates, only 187 collectives would be eligible to participate in the permitting process under Ordinance 181069.
- While the total number of collectives in the City is unknown, it is fair to assume based on the plaintiffs in *Americans for Safe Access v. City of Los Angeles* (and related cases) that there are at least 400 existing collectives in the City that would be impacted by the amended ordinance.
- A grandfather date of November 13, 2007 could reduce the total number of collectives to just 187. This would result in a 53% reduction in the number of collectives in the City.

A reduction in the total number of collectives will create a greater burden on the remaining collectives in the City who will be tasked with meeting the needs of a greater number of patients. There are foreseeable environmental consequences that implicate agriculture, air quality, water quality, traffic, land use planning, etc. Consider the following:

- Assuming medical marijuana patients comprise 2% of the Los Angeles population then there are 76,987 patients in Los Angeles.
- Assuming patients use 1 ounce of marijuana per month, then 57,740 pounds of cannabis per year would need to be cultivated to meet patient needs.
- This amounts to 144 pounds per year/per collective if there are 400 collectives in the City.
- Any reduction in the number of collectives, however, would <u>increase</u> the cultivation requirement of each collective. If the City was to reduce the total number of collectives to 187, for example, then the remaining collectives would have to increase cannabis cultivation by 144.7 pounds per year (or 288.7 pounds/per collective).
- In other words, each collective would need to increase production by almost <u>100%.</u>

Such a large increase in cannabis production may have significant effects on the environment. Obviously, larger cultivation facilities will be required and additional waste water will be created as a result of these cultivation activities. Moreover, additional waste plant material (a.k.a bio-waste) will be created that must be disposed of properly. There will also be an increase in the electrical consumption that will be required. Approximately 400 watts of electricity is required to grow one pound of cannabis per year. These facts are compelling and demonstrate potential significant environmental effects in terms of (1) Greenhouse Gas Emissions, (2) Hazards & Hazardous Materials, (3) Hydrology / Water Quality, and (4) Utilities / Service Systems.

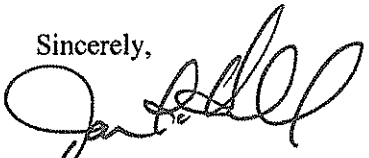
Moreover, there are transportation/traffic and air quality issues that are implicated as well. It is undisputed that the buffer zone requirements outlined in Ordinance 181069 would compel the mass relocation of hundreds of collectives, many of which would be forced to relocate to entirely new areas

of the City. The buffer zone requirements will also have another intended consequence – they will cluster collectives within the few areas of CPA's that comply with the buffer zone requirements and residential restrictions embodied in Ordinance 181069. Because collectives are necessarily comprised of patients and caregivers that live in the community (and presumably in residential areas), these individuals (who have a medical need) will have to travel much further to visit the collective of which they are a member. Collectives are not mere cogs that can simply be switched out and replaced without consequence and when one collective "replaces" another in a community, patients will not necessarily join that collective. Patients will likely travel by car or public transit. Also, those patients that were previously within walking distance of their collective must now drive or use public transit to visit their collective. In essence, compelled relocation turns certain patients into commuters. Further, significant land use/planning impacts may result from the amended ordinance. The clustering of collectives *within* CPA's creates land use compatibility problems that the City is compelled to analyze under CEQA. There are also environmental concerns in the form of "Public Services." Collectives are inherently formed for the collective cultivation of medical marijuana and are comprised of patients with medical needs. Patient member services (which span the gamut and are often designed for healing) will be impacted when existing collectives are forced to close and destroyed. This could have an effect on "public services."

Conclusion

While the above discussion is not intended to be an exhaustive list of the reasonably foreseeable indirect or secondary effects of the adoption of the amended ordinance (which has yet to be presented to the public), it is illustrative of the types of impacts that the City must analyze. A fair argument has been outlined regarding the significant environmental effects of any amended ordinance that compels mass relocation or significant reductions in the number of collectives in the City. As such, the City must conduct an Initial Study under CEQA and provide the public with a review period to comply with the legal mandates of CEQA.

Sincerely,



Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

Exhibit 2

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

January 21, 2011

VIA PERSONAL DELIVERY

Council President Garcetti and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Sprint Street, Room 340
Los Angeles, CA 90012

Re: Council File 08-0923-S7 re Los Angeles Medical Marijuana Ordinance

Dear President Garcetti and Council members

This firm continues to represent the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed amendment of Ordinance No. 181069 ("amended ordinance"). This letter is a follow-up to the letter dated January 14, 2010 regarding the applicability of the California Environmental Act ("CEQA") to the amended ordinance. At the time of the drafting of the last letter, UMMP and ADHC had not received a copy of the proposed amendments to Ordinance No. 181069. This letter addresses the substantive and procedural defects associated with the amended ordinance and reiterates that the amended ordinance is not exempt from CEQA.

Compliance with California Environmental Quality Act

UMMP and ADHC continue to assert that the amended ordinance is not exempt from CEQA and urge the City to conduct an Initial Study to ascertain whether there may be significant effects on the environment. City Attorney Report No. R11-0124 states that the amended ordinance is exempt from CEQA under State CEQA Guidelines sections 15060(c)(2) and (3) and 15378(b)(5) "because it will not result in a direct or reasonably foreseeable indirect physical change in the environment, because it merely amends administrative provisions in the Medical Marijuana Ordinance in response to the December 10, 2010, Preliminary Injunction Order of the Los Angeles Superior Court . . . ." As detailed at length in the previous correspondence submitted to City Council on January 14, 2011, UMMP and ADHC have described a variety of direct or reasonably foreseeable indirect physical changes in the environment. The City has failed to rebut these assertions. Moreover, it is not accurate

to characterize the proposed ordinance as "merely amed[ing] administrative portions in the Medical Marijuana Ordinance." City Attorney Report R11-0124 also states that the amended ordinance is exempt from CEQA "because it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, because it merely clarifies and amends administrative provisions in the Medical Marijuana Ordinance relating to medical marijuana collectives." Again, it is completely inaccurate to state that the proposed ordinance "merely clarifies" the City's Medical Marijuana Ordinance and there is "no possibility" that there may be a significant effect on the environment. The City has devised an entirely new mechanism to ascertain which collectives will be allowed to operate in the City and the priority order in which those collectives will be reviewed by the Department of Building and Safety ("DBS") in the pre-inspection application process. Collectives that met the City's requirements regarding ownership/management, criminal background, continuity, etc. previously were guaranteed the opportunity to participate in the City's permitting process for medical marijuana collectives under Ordinance 181069 (assuming they timing filed all necessary documents with the City Clerk.) However, the amended ordinance removes this guarantee and establishes a lottery whereby only 100 collectives that existed prior to September 14, 2007 will be allowed to participate in the City's permitting process. This process could easily prevent the oldest and most established collectives in the City of Los Angeles to be forced to close. Shutting down the most established collectives in the City certainly may have a significant effect on the environment as it will completely destroy the patient communities that have developed within the collectives. As described more fully below, there may be impacts in terms of cultural resources and ascetics that the City has failed to consider. The amended ordinance also changes the priority order in which DBS processed pre-inspection applications. The priority order is important because there is a cap on the number of collectives in each Community Plan Area. Because the lottery process is completely random, the oldest and most established collectives could obtain a very undesirable priority order number (for example, 98). The effect would be that these collectives would be forced to relocate to less desirable CPAs in terms of available real estate, patient accessibility, etc. The City has failed to analyze the environmental effects of rearranging 100 existing collectives to other parts of the City based on the results of the proposed lottery. These effects could be profound and include transportation/traffic, air quality, aesthetics, agriculture, cultural resources, land use planning and public services. Consider the cultural resources that could be impacted as just one example:

Cultural Resources

Collectives are communities made up of patients and caregivers. A collective is NOT about the mere distribution and cultivation of medical marijuana. For example, ADHC offers a range of patient member services, including (1) Live Music, (2) Organic Food, (3) Community Gardening, (4) Art, and (5) Counseling. Both patients and healing practitioners visit ADHC to assist patients who are experiencing medical problems. ADHC also has a gallery and curator. Artists often come from the local community, but also include patients. Counseling is also provided such as acupuncture, tax advice, and emotional counseling. Much like a church is much more than just a place to worship, a collective is more than a place for the collective cultivation of marijuana. On the contrary, a wide range of patient members services are offered at many collectives and communities have developed around these collectives. The amended ordinance threatens to destroy this community. For example, ADHC could be forced to move from downtown Los Angeles to the Valley and this would have a profound impact on the health and vitality of the collective. Some patients would simply not be able to make the drive and this would deeply impact the collective community. Local artists would not have ADHC has

a venue to display work and, most importantly, an established piece of the local community for over 4 years would simply disappear. Any ordinance that threatens to shut down a patient organization is disrupting the culture that has developed within these collectives. This would certainly impact cultural resources and requires review under CEQA.

For the reasons outlined below, the amended ordinance is not exempt from CEQA and the City must prepare an Initial Study and give the public an opportunity to comment prior to adoption.

Amended Ordinance Does Not Fully Remedy Defects Found by Judge Mohr

Judge Mohr's December 10, 2010 Order specifically enjoined the City from enforcing Section 45.19.6.2(A) to the extent it deprives collectives of vested property rights without a neutral hearing. The City's amended ordinance does not rectify the defects identified by Judge Mohr. The amended ordinance merely identifies a different arbitrary retroactive date (9/14/2007) and demands proof of operation. Significantly, the amended ordinance does NOT provide for a neutral hearing officer or a procedure for determining proof or failure of proof BEFORE denying pre-existing rights to collectives. Section 45.19.6.7 still requires immediate closure for a collective, until it complies. As such, the City has failed to rectify the defects identified by Judge Mohr.

Collectives Should be Given an Opportunity to Provide Alternative Locations in Pre-Inspection Application Process in Event CPA Caps are Met

As currently proposed, collectives will have to provide DBS with their intended relocation site and then DBS will process applications by priority order. Once a cap in a CPA has been met, DBS will stop processing inspections for that particular CPA and will notify all collectives who had indicated that they wanted to relocate to that CPA that they are "disqualified." UMMP and ADHC has spoken to the individual at DBS responsible for implementing the City's Medical Marijuana Ordinance and he has confirmed that pre-ICO collectives on the priority order list will NOT be given an opportunity to provide an alternative location. The problem with this scenario is that collectives are not necessarily aware of the relocation plans of others and this will lead to the unintended disqualification of many pre-ICO collectives. For example, what if a collective with a higher priority order within a CPA proposes to relocate to a property that is too close to a collective with a lower priority order (i.e. within 1000 feet)? The Information Bulletin published by DBS simply states that a collective will be notified of their "disqualification."[1] It is unreasonable and unlawful to summarily disqualify a collective under these circumstances and the City Council will yet again be faced with amending the Ordinance when this scenario begins to come to fruition. UMMP and ADHC respectfully suggest that the Council address the situation *now* by directing DBS to allow collectives an opportunity to provide alternative locations and to revise Pre-Inspection Applications during the process. UMMP and ADHC suggest the following amendment to Section 45.19.6.2(D):

> "The Department of Building and Safety shall review pre-inspections by Community Plan Area to evaluate the compliance of the proposed collectives with the requirements of Section 45.19.6.3 A of this article. The Department of Building and Safety shall review pre-inspections by priority order within each Community Plan Area, with

[1] *See* http://www.ladbs.org/faq/info%20bulletins/general%20info/2010/IB-P-GI%202010-029%20Med%

collectives who are currently located in the Community Plan Area being considered before those seeking to relocate to the Community Plan Area. Once the Department of Building and Safety has determined that the maximum number of collectives authorized by Subsection B of this section complies, the Department of Building and Safety shall stop determining the compliance of more collectives. Any collective not in compliance with the requirements of Section 45.19.6.3 A of this article, as determined by the Department of Building and Safety shall be notified by the Department of Building and Safety and be given an opportunity to correct the deficiencies. Collectives not considered for compliance because the cap has already been met shall be given the opportunity to submit alternate locations to the Department of Building and Safety (and revised application materials) in Community Plan Areas in which the caps have not been exceeded."

Priority Order List Computation Should be Based on Establishment Rather than Registration to Avoid Unintended Consequences

The Ordinance requires the City Clerk to prepare a "priority order" list that DBS is expected to follow when conducting pre-inspections. Section 45.19.6.2(C)(1). However, the priority order list is now proposed to be based on the results of the lottery. This creates the unintended consequence of pushing more established collectives in the community out of their current Community Plan Area to allow for collectives that may be new to the area. This is bad for patients, residents, neighbors and the community as the forced relocation disturbs existing relationships and bonds that have been formed. UMMP and ADHC propose that Section 45.19.6.2(C)(1) of the Ordinance be revised to establish priority order based on the "starting" date of a collective's City of Los Angeles Registration Tax Certificate. The revised language would be as follows: "The City Clerk shall use the date that these collectives "started" as evidenced by the City of Los Angeles Tax Registration Certificate filed with the City Clerk pursuant to Interim Control Ordinance No. 179,027 to determine the priority order in which the Department of Building and Safety will conduct the pre-inspections of these collectives." Additionally, UMMP and ADHC propose that DBS be required to process applications for collectives already located in a particular CPA *before* those seeking to relocate to that CPA. This would again be in the best interest of the community as it would reduce the number of collectives moving to a new CPA thereby reducing impacts to the community, including but not limited to traffic, air quality and public service impacts.

Vested Property Rights

The City has issued building permits to collectives throughout the City over the years and those collectives have obtained a vested right to stay in their current locations.[2] If anything, Ordinance 181069 merely converted these collectives into legal, non-conforming uses. Collectives are protected by the doctrine of legal, non-conforming uses and the City cannot summarily shut down collectives via

[2] The issuance of a building permit is not the exclusive means by which a vested right may be acquired. *Avco Community Developers, Inc. v. South Coast Regional Com.* (1976) 17 Cal. 3d 785 (criticizing previous courts "blind insistence" on an instrument entitled "building permit" and noting that in some circumstances a developer may acquire a vested right even though the permit is not actually a "building permit.")

the enforcement of §45.19.6.7 without violating article I, section 19, of the Constitution of California ("Private property may be taken or damaged for a public use and only when just compensation . . . has first been paid to, or into court for, the owner.") Many collectives in the City have fully complied with all applicable state and local regulations and obtained all necessary certificates and permits from the City (including a Business Tax Registration Certificate). *City of Los Angeles v. Gage* (1954) 127 Cal.App.2d 442, 453 (noting that nonconforming use is a "*lawful* use existing on the effective date of the zoning restriction and continuing since that time in nonconformance to the ordinance.")

Because of collectives' status as a legal, nonconforming use, the City cannot eliminate collectives' use without just compensation .*Metromedia, Inc.* v. *City of San Diego* (1980) 26 Cal.3d 848, 881, rev. on other grounds *Metromedia, Inc.* v. *San Diego* (1981) 453 U.S. 490 (noting that a cities may eliminate nonconforming use by either of two "constitutionally equivalent alternatives: It can eliminate the use immediately by payment of just compensation, or it can require removal of the use without compensation following a reasonable amortization period."); *National Adver. Co. County of Monterey* (1970) 1 Cal.3d 875, 879 (noting that amortization period provided for the eventual discontinuance of nonconforming uses must be "reasonable and commensurate with the investment involved.") The City's immediate threat to summarily shut down collectives unsuccessful in the new registration, lottery and pre-inspection process does not comport with the California constitution's mandate to provide just compensation.

Further, any attempt to close pre-exiting collectives that were unlucky enough to lose the lottery or be "disqualified" by DBS would be tantamount to a revocation of collectives' validly issued building permits, tax registration certificates, etc. However, because of collectives' vested right, the City's ability to revoke permits or certificates is severely limited and subject to strict due process requirements. *Trans-Oceanic Oil Corp. v. Santa Barbara,* (Cal. App. 1948) 85 Cal. App. 2d 776, 784 ("If a permittee has acquired a vested property right under a permit, the permit cannot be revoked. The principle is stated in 9 American Jurisprudence, section 8, page 204: "By the weight of authority, a municipal building permit or license may not arbitrarily be revoked by municipal authorities, particularly where, on the faith of it, the owner has incurred material expense. Such a permit has been declared to be more than a mere license revocable at the will of the licensor. When, in reliance thereon, work upon the building is actually commenced and liabilities are incurred for work and material, the owner acquires a vested property right to the protection of which he is entitled." Internal citations omitted.). The City has not provided collectives unsuccessful in the permitting process with any means by which to be heard in revoking collectives' right to operate a medical marijuana collective. *Trans-Oceanic Oil Corp. v. Santa Barbara*, (Cal. App. 1948), 85 Cal. App. 2d 776, 795 ("In determining that a permit, validly issued, should be revoked, the governing body of a municipality acts in a quasi-judicial capacity. In revoking a permit lawfully granted, due process requires that it act only upon notice to the permittee, upon a hearing, and upon evidence substantially supporting a finding of revocation.") In any event, the City does not have good cause to revoke the overwhelming majority of permits issued to collectives or to prohibit their operations. *Goat Hill Tavern v. City of Costa Mesa*, (Cal. App. 4th Dist. 1992) 6 Cal. App. 4th 1519, 1530 ("Interference with the right to continue an established business is far more serious than the interference a property owner experiences when denied a conditional use permit in the first instance. Certainly, this right is sufficiently personal, vested and important to preclude its extinction by a nonjudicial body.")

Finally, both collectives and patients have a fundamental, vested right to their continued existence, operation and locations. Under California law, denial of an application of an existing permit warrants heightened judicial review as fundamental vested rights cannot be extinguished by a body

lacking judicial power. *Goat Hill Tavern v. City of Costa Mesa* (1992) 6 Cal. App. 4th 1519, 1525 (stating that "[i]nterference with the right to continue an established business is far more serious than the interference a property owner experiences when denied a conditional use permit in the first instance. Certainly, this right is sufficiently personal, vested and important to preclude its extinction by a nonjudicial body. . .). Pursuant to Cal. Code Civ. Pro. §1094.5, collectives are entitled to an independent, judicial review of the City's actions applying the "independent judgment test." See *Strumsky v. San Diego County Employees Ret. Ass'n* (1974) 11 Cal. 3d 28, 31 ("[i]f the order or decision of the agency substantially affects a fundamental vested right, the trial court, in determining under section 1094.5 whether there has been an abuse of discretion because the findings are not supported by the evidence, must exercise its independent judgment on the evidence and find an abuse of discretion if the findings are not supported by the weight of the evidence"). Under the independent judgment test, a court determines – using its own judgment - whether the weight of the evidence supports an agency's decision. See *Harlow v. Carleson* (1976) 16 Cal. 3d 731, 735 ("[t]he independent judgment or weight of the evidence test . . . requires the trial court to reconsider the evidence and make its own independent findings of fact"); see *San Dieguito Union High Sch. Dist. v. Comm'n on Prof'l Competence* (1985) 174 Cal. App. 3d 1176, 1180 ("[t]he trial court is 'not bound by the findings of the Commission in exercising its independent judgment review, and, . . . [is] free to make its own determination of the credibility of witnesses in the process.'")(internal citations omitted).

Moreover, collectives' vested rights are "fundamental." See *Bixby v. Pierno* (1971) 4 Cal. 3d 130, 144-5 ("In determining whether the right is fundamental the courts do not alone weigh the economic aspect of it, but the effect of it in human terms and the importance of it to...the life situation"); see *Whaler's Vill. Club v. Cal. Coastal Com.* (1985) 173 Cal. App. 3d 240, 252 (quoting *Frink v. Prod* (1982) 31 Cal.3d 166, 176) (noting the test for "vestedness" and "fundamentalness" is one and the same, saying "[t]he ultimate question in each case is whether the affected right is deemed to be of sufficient significance to preclude its extinction or abridgement by a body lacking judicial power"). Collectives are considered essential to thousands of patients who depend on medical marijuana. Closure or relocation of collectives would have substantial financial impacts and could destroy collective operations altogether. Relocation of collectives would fracture existing collective communities.

Conclusion

For the reasons outlines in this letter and the correspondence dated January 14, 2011, UMMP and ADHC urge the City to postpone the adoption of the amended ordinance to allow for a throughout review of the substantive and procedural defects described herein.

Sincerely,

Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

Exhibit 3

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

June 8, 2012

VIA PERSONAL DELIVERY

Council President Wesson and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Sprint Street, Room 340
Los Angeles, CA 90012

Re: Council File 08-0923-S17 re Los Angeles Medical Marijuana Ordinance 'Gentle Ban Approach'; Compliance with California Environmental Quality Act

Dear President Wesson and Council members:

This firm represents the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed new medical marijuana ordinance replacing the current ordinance with a co-called "gentle ban" (hereinafter referred to as "gentle ban"). For the reasons outlined below, a proposed "gentle ban" is not exempt from the California Environmental Quality Act ("CEQA") and the City must prepare an Initial Study and give the public an opportunity to comment prior to adoption.

The Gentle Ban is Not Exempt from the California Environmental Quality Act

While the precise ordinance language of the proposed "gentle ban" has yet to be released for public review, the Motion presented by Paul Koretz and Herb Wesson states the following:

> "A second more reasonable approach to compliance could include a limited immunity approach whereby the City proceeds forward with a ban on dispensaries but uses its prosecutorial discretion to abstain from any enforcement action against the limited number of dispensaries that do not violate a set of City Council imposed restrictions. This approach would protect neighborhoods while still assuring limited safe access for patients within the confines of ever evolving case law."

The proposed Ordinance does not identify or outline the proposed "set of City Council imposed

restrictions." However, if these restrictions include either a requirement that collectives relocate or ceases operations, then review under CEQA is required. Under CEQA, the City is compelled to analyze whether the proposed project will result in any "significant, adverse effects on the environment." Regardless of the City's asserted position regarding the legality of the hundreds of existing medical marijuana collectives in the City, the fact remains that medical marijuana collectives have existed in the City for at least 6 years. This is the environmental baseline and status quo. The City's previous medical marijuana ordinances sought to uproot established collectives and relocate them to other parts of the City and new Community Planning Areas ("CPAs"). According to the City's own records, only a handful of collectives would have met either the previous ordinances' buffer zone requirements such that they were not forced to relocate. If the City chooses to adopt a similar regulatory regime in the form of a "gentle ban" that compels the mass relocation of hundreds of existing collectives, then they must review this action under CEQA. Moreover, any grandfather date or restrictions that effectively reduce the number of collectives in the City will certainly change the environmental status quo by reducing the total number of collectives and access to medical marijuana. Patients have come to depend on the existing locations in the City. A "gentle ban" that results in mass relocation or the reduction in the total number of existing collectives will result in a physical change in the environment and requires review under CEQA. This impact is not speculative and is certainly foreseeable.

The City is compelled to prepare an Initial Study pursuant to §15063 of the California Public Resources Code as there are no applicable exemptions established in Division 13, Articles 18 or 19 of the California Public Resources Code.

Any Initial Study conducted by the City must analyze the reasonably foreseeable indirect or secondary effects of the proposed "gentle ban." The term "project" as defined in Cal. Pub. Res. Code § 21065 has been broadly interpreted by courts. For example, in a seminal case decided by the California Supreme Court, the court stated that CEQA is "to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259. Further courts have concluded that the term "project" encompasses regulatory approvals such as general plan amendments, zone changes, and annexations which may ultimately lead to physical environmental changes. 14 Cal. Code Regs. § 15378(a)(1); *Bozung v. Local Agency Formation Commission*, (1975) 13 Cal. 3d 263, 277 n.16, 118 Cal. Rptr. 249. The City is required under CEQA to undertake a review of an ordinance when it is apparent that the regulations will "*culminate* in physical change to the environment." *Bozung v. Local Agency Formation Commission*, 13 Cal. 3d 263, 281 (emphasis added).

The fact that the "project" at issue is the adoption of an ordinance as opposed to a development project proposed by an applicant does not relieve the City of the obligation to undertake a review of the project under CEQA. *Rosenthal v. Board of Supervisors* (1975) 14 Cal.App.3d 815, 823 (stating that "adopting an ordinance [is] a project"); *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 118 Cal.Rptr. 34 (impliedly holding that adoption of ordinance is a project within the meaning of CEQA); 60 Ops.Cal.Atty.Gen. 335 (1977) ("ordinances and resolutions adopted by a local agency are 'projects' within the meaning of CEQA"). The Attorney General Opinion issued in 1977 concluded that the following ordinances were all subject to CEQA: (1) an open-range ordinance requiring private land owners to fence out cattle; (2) an ordinance allowing construction of single family dwellings in rural areas without electricity, running water, or flush toilets; and (3) an ordinance modifying road

improvement standards for new subdivisions. The bottom line is that a project need not directly effect a physical change in the environment: reasonably foreseeable indirect or secondary effects must also be analyzed. The relative inquiry is whether or not the project, or in this case, a proposed "gentle ban," will ultimately culminate in physical changes to the environment. *Id.* As described below, any proposed "gentle ban" will unquestionably culminate in a physical change to the environment if collectives are either required to relocate or cease operations and any Initial Study that the City conducts must analyze these impacts before the City can adopt the "gentle ban."

The environmental impacts of a "gentle ban" could be profound. The environmental factors that the City is compelled to consider include the following: (1) Aesthetics, (2) Agriculture and Forestry, (3) Air Quality, (4) Biological Resources, (5) Cultural Resources, (6) Geology / Soils, (7) Greenhouse Gas Emissions, (8) Hazards & Hazardous Materials, (9) Hydrology / Water Quality, (10) Land Use / Planning, (11) Mineral Resources, (12) Noise, (13) Population / Housing, (14) Public Services, (15) Recreation, (16) Transportation/Traffic, and (17) Utilities / Service Systems. While a "gentle ban" may not have a significant effect on the environment with respect to one particular environmental factor (e.g. Mineral Resources), it may nonetheless have a significant environmental effect on another factor (e.g. Transportation / Traffic). Without conducting an Initial Study, the City has no way of knowing the effects on the environment. Here are some facts to consider:

- Ordinance 181069 only allowed those collectives that successfully registered with the City on or before November 13, 2007 to continue to operate in the City.
- Ordinance No. 181612 places a cap of 100 collectives in the City.
- Based on the City's estimates, only 187 collectives would be eligible to participate in the permitting process under Ordinance 181069.
- While the total number of collectives in the City is unknown, it is fair to assume based on the plaintiffs in *Americans for Safe Access v. City of Los Angeles* (and related cases) that there are at least 400 existing collectives in the City that would be impacted by a proposed "gentle ban."
- A grandfather date of November 13, 2007 could reduce the total number of collectives to just 187. This would result in a 53% reduction in the number of collectives in the City.

A reduction in the total number of collectives will create a greater burden on the remaining collectives in the City who will be tasked with meeting the needs of a greater number of patients. There are foreseeable environmental consequences that implicate agriculture, air quality, water quality, traffic, land use planning, etc. Consider the following:

- Assuming medical marijuana patients comprise 2% of the Los Angeles population then there are 76,987 patients in Los Angeles.
- Assuming patients use 1 ounce of marijuana per month, then 57,740 pounds of cannabis per year would need to be cultivated to meet patient needs.
- This amounts to 144 pounds per year/per collective if there are 400 collectives in the City.
- Any reduction in the number of collectives, however, would <u>increase</u> the cultivation requirement of each collective. If the City was to reduce the total number of collectives to 187, for example, then the remaining collectives would have to increase cannabis cultivation by 144.7 pounds per year (or 288.7 pounds/per collective).
- In other words, each collective would need to increase production by almost <u>100%.</u>

Such a large increase in cannabis production may have significant effects on the environment. Obviously, larger cultivation facilities will be required and additional waste water will be created as a result of these cultivation activities. Moreover, additional waste plant material (a.k.a bio-waste) will be created that must be disposed of properly. There will also be an increase in the electrical consumption that will be required. Approximately 400 watts of electricity is required to grow one pound of cannabis per year. These facts are compelling and demonstrate potential significant environmental effects in terms of (1) Greenhouse Gas Emissions, (2) Hazards & Hazardous Materials, (3) Hydrology / Water Quality, and (4) Utilities / Service Systems.

Moreover, there are transportation/traffic and air quality issues that are implicated as well. It is undisputed that the buffer zone requirements outlined in previous ordinances will compel the mass relocation of hundreds of collectives, many of which would be forced to relocate to entirely new areas of the City. The buffer zone requirements will also have another intended consequence – they will cluster collectives within the few areas of the City that comply with the buffer zone requirements and residential restrictions. Because collectives are necessarily comprised of patients and caregivers that live in the community (and presumably in residential areas), these individuals (who have a medical need) will have to travel much further to visit the collective of which they are a member. Collectives are not mere cogs that can simply be switched out and replaced without consequence and when one collective "replaces" another in a community, patients will not necessarily join that collective. Patients will likely travel by car or public transit. Also, those patients that were previously within walking distance of their collective must now drive or use public transit to visit their collective. In essence, compelled relocation turns certain patients into commuters. Further, significant land use/planning impacts may result from the "gentle ban." The clustering of collectives *within* certain areas of the City creates land use compatibility problems that the City is compelled to analyze under CEQA. There are also environmental concerns in the form of "Public Services." Collectives are inherently formed for the collective cultivation of medical marijuana and are comprised of patients with medical needs. Patient member services (which span the gamut and are often designed for healing) will be impacted when existing collectives are forced to close and destroyed. This could have an effect on "public services."

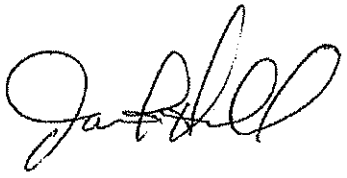
Finally, there are cultural resources that the City must consider under CEQA. Collectives are communities made up of patients and caregivers. A collective is NOT about the mere distribution and cultivation of medical marijuana. For example, ADHC offers a range of patient member services, including (1) Live Music, (2) Organic Food, (3) Community Gardening, (4) Art, and (5) Counseling. Both patients and healing practitioners visit ADHC to assist patients who are experiencing medical problems. ADHC also has a gallery and curator. Artists often come from the local community, but also include patients. Counseling is also provided such as acupuncture, tax advice, and emotional counseling. Much like a church is much more than just a place to worship, a collective is more than a place for the collective cultivation of marijuana. On the contrary, a wide range of patient members services are offered at many collectives and communities have developed around these collectives. A "gentle ban" requiring either closure of relocation threatens to destroy this community. For example, ADHC could be forced to move from downtown Los Angeles to the Valley and this would have a profound impact on the health and vitality of the collective. Some patients would simply not be able to make the drive and this would deeply impact the collective community. Local artists would not have ADHC has a venue to display work and, most importantly, an established piece of the local community for over 5 years would simply disappear. Any ordinance that threatens to shut down a patient

organization is disrupting the culture that has developed within these collectives. This would certainly impact cultural resources and requires review under CEQA.

Conclusion

While the above discussion is not intended to be an exhaustive list of the reasonably foreseeable indirect or secondary effects of the adoption of a "gentle ban" (which has yet to be presented to the public), it is illustrative of the types of impacts that the City must analyze. A fair argument has been outlined regarding the significant environmental effects of any "gentle ban" that compels mass relocation or significant reductions in the number of collectives in the City. As such, the City must conduct an Initial Study under CEQA and provide the public with a review period to comply with the legal mandates of CEQA.

Sincerely,



Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

Exhibit 4

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

June 8, 2012

VIA PERSONAL DELIVERY

Council President Wesson and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Sprint Street, Room 340
Los Angeles, CA 90012

Re: Council File 11-1737-S1 re Los Angeles Medical Marijuana Ordinance; Compliance with California Environmental Quality Act

Dear President Wesson and Council members:

This firm represents the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed new medical marijuana ordinance banning so-called "medical marijuana businesses." For the reasons outlined in the attached Analysis, the proposed not exempt from the California Environmental Quality Act ("CEQA") and the City must prepare an Initial Study and give the public an opportunity to comment prior to adoption.

Sincerely,

Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

PLANNING & PERMIT TECHNOLOGIES, INC.
Building - Planning/Zoning - Permitting - Consulting Services

2012-1273-CE Planning & Zoning/CEQA Analysis_Comments On City's Proposed Environmental Determination/Document ENV 2012-1273-CE/Notice of Exemption

June 8

2012

Project Description (City of Los Angeles):

An ordinance (Appendix A) repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code in response to recent appellate court decisions concerning regulation of medical marijuana.

Lead Agency:

City of Los Angeles Department of City Planning.

Project Title:

Proposed Ordinance Concerning Regulation of Medical Marijuana.

Project Location:

Citywide

Description of Nature, Purpose, and Beneficiaries of Project (City of Los Angeles):

An ordinance repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code in response to recent appellate court decisions concerning regulation of medical marijuana.

Justification for Project Exemption (City of Los Angeles):

The proposed ordinance would have no direct or reasonably foreseeable indirect physical impact upon the environment. Also, the proposed ordinance solely impacts the operation of existing private structures involving negligible or no expansion of use; is a minor alteration in land use limitations; is an action to assure the maintenance, enhancement, or protection of the environment; and is an action to enforce a law, general rule, standard, and objective.

PLANNING & PERMIT TECHNOLOGIES, INC.
Building · Planning/Zoning · Permitting · Consulting Services

Council President Wesson and members of the Los Angeles City Council
Members of the Los Angeles City Council
City of Los Angeles,
200 N. Spring Street, Room 340
Los Angeles, CA 90012

Re: Response and comments (rebuttal) on the City of Los Angeles's determination to find that the "Project", a proposed ordinance repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code, that will serve to effectively ban medical marijuana businesses

Dear President Wesson and Council members:

As a practicing professional urban planner with significant experience (20 years working in the public sector at jurisdictions across the State) and expertise in the real application of Local Municipal Code Regulations, California Planning & Zoning Law, the Subdivision Map Act, the Permit Streamlining Act, the California Environmental Quality Act (CEQA), General Plan Law, and all matters with respect to applicable Federal, State, and Local Planning and Zoning Legislation I have been retained to present my analysis, findings, and opinions surrounding the City of Los Angeles's preliminary determination that a proposed Citywide ordinance repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code that will serve to ban "medical marijuana businesses" while also (allegedly) preserving the activities associated with this land use pursuant to State law is "Categorically Exempt" from the provisions of CEQA. To this purpose a summary introduction of the component parts of the comprehensive analysis contained in this correspondence is presented below followed by a summary of the my conclusions on this matter.

Enclosed herein is a narrative in objection to the City's determination that a proposed citywide ordinance repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code that will serve to ban "medical marijuana businesses" while also preserving the activities associated with this land use pursuant to State law is "Categorically Exempt" from the provisions of CEQA. Particularly this correspondence will provide a two (2) part analysis with conclusions focusing on the following themes:

1. A general discussion concerning the standards and intentions of CEQA as they are typically applied by the professional planning community throughout the State; and
2. A specific and detailed (in an exhaustive manner) "rebuttal" of the CEQA Narrative (ENV 2012-1273-CE) document and proposed "Notice of Exemption" in support of the City's proposed determination that the "project" that is the subject of this matter is "exempt" from the provisions of CEQA.

The following is a summary of the conclusions that are supported in detail in the body of the correspondence.

1. The "Project/Proposal" is not accurately described in either the "Project Description" within the CEQA Narrative document entitled "ENV 2012-1273-CE" or the proposed "Notice of Exemption";
2. The analysis of the "Project/Proposal" ignores and does not address/analyze in any way the critical element of the proposed ordinance that will preserve many of the activities associated with the subject land use that the City is seeking to ban;
3. There are both "direct and indirect reasonably foreseeable impacts" associated with this "Project/Proposal" when CEQA is applied as it is intended and when the entirety of the "Project/Proposal" is comprehensively considered;

4. There are clear "Location" issues and "Unusual Circumstances" surrounding the subject land use and its regulation and therefore pursuant to "Section 15300.2 Exceptions (a) and (c)" the subject "Project/Proposal" is not "exempt" from CEQA;
5. None of the various classes of project types recognized as "Categorically Exempt" from the provisions of CEQA that are cited by the City in their proposed CEQA Narrative document, "ENV 2012-1273-CE" and their proposed "Notice of Exemption" apply to the subject "Project/Proposal"; and
6. The City's "faux" "Initial Study" included within the CEQA Narrative document entitled "ENV 2012-1273-CE" does not include an analysis of the entirety of the "Project/Proposal" nor does it provide the thorough vetting of the potential impacts and in turn, alternatives and mitigation that may be determined necessary if this project were analyzed properly/appropriately/conscientiously.

BACKGROUND

In 2007, the City adopted Interim Control Ordinance ("ICO)" No. 179027, which prohibited the establishment of new medical marijuana collectives until such time as a permanent ordinance could be adopted. Significantly, the City broadly defined the prohibited activity. The City defined a "Medical Marijuana Dispensary" as follows: "**any** use, facility, or **location**, including but not limited to a retail store, office building, or structure **that distributes, transmits, gives, dispenses, facilitates or otherwise provides marijuana in any manner**, in accordance with State law, in particular, California Health and Safety Code Sections 11362.5 through 11362.83, inclusive." (emphasis added). A total of 219 medical marijuana collectives registered with the City under the ICO.

In 2010, the City adopted permanent Medical Marijuana Ordinance ("MMO") No. 181069. Section 45.19.6.1(B) of the MMO defined a "Medical Marijuana Collective" as follows: "An incorporated or unincorporated association, composed solely of four of more qualified patients, persons with identification cards, and designated primary caregivers of qualified patients and persons with identification cards . . . who associate at a particular location to collectively or cooperatively cultivate marijuana for medical purposes, in strict accordance with California Health and Safety Code Sections 11362.5. *et seq.*" No permits or "registrations" were issued by the City under the MMO and the City subsequently adopted Temporary Urgency Ordinance No. 181530, which amended the MMO to comply with court order.

The City's proposing ordinance bans "medical marijuana businesses," which are defined in the draft ordinance as either of the following: "(1) Any location where marijuana is cultivated, processed, distributed, delivered or given away to a qualified patient, a person with an identification card, or a primary caregiver. (2) Any vehicle or other mode of transportation, stationary or mobile, which is used to transport, distribute, deliver, or give away marijuana to a qualified patient, a person with an identification card, or a primary caregiver." *See* Section 45.19.6.1(1)-(2). However, the proposed ordinance specifically excludes from the definition "Any **dwelling unit** where a maximum of three (3) or fewer qualified patients, persons with an identification card, and/or primary caregivers process or associate to **collectively or cooperatively cultivate marijuana on-site** for their own personal medical use or, with respect to the primary caregivers, for the personal medical use of the qualified patients or persons with an identification card who have designated the individual as a primary caregiver, in accordance with California Health and Safety Code Sections 11362.5 and 113621 et seq.;" *See* Section 45.19.6.1(3)(a) (emphasis added). Notably, the proposed ordinance requires all cultivation of medical

marijuana to be conducted onsite within the City of Los Angeles and only allows medical marijuana collectives of less than four persons in "dwelling units."

ANALYSIS

The "ANALYSIS" herein consists of two (2) component parts that will individually and collectively serve to provide the necessary evidence for the City of Los Angeles ("City") to reconsider the proposed determination that the subject project is "exempt" from CEQA.

The initial component of this analysis presents context that will serve to set the reasonable and practical parameters under which CEQA is intended and typically applied for "unusual" projects of this nature. Following the contextual discussions is a detailed "rebuttal" of the City's CEQA Narrative document, **"ENV 2012-1273-CE"**.

General CEQA Comments

The following sections of the State's Public Resources Code, commonly referred to as "CEQA" provide the context and intentions to which CEQA is to be applied by the lead and responsible agencies and their professional planning staff. It will be clear after this contextual analysis that with respect to this matter/"Project/Proposal", CEQA is not being applied in a manner consistent with the articulated intentions.

- **§ 21000 Legislative Intent/§ 21001 Additional Legislative Intent** (CEQA California Public Resources Code Division 13. Environmental Quality);
- **§ 21001.1 Review of Public Agency Projects** (CEQA California Public Resources Code Division 13. Environmental Quality);
- **§ 21002 Approval of Projects; Feasible Alternative or Mitigation Measures** (CEQA California Public Resources Code Division 13. Environmental Quality);
- **§ 21003.1 Environmental Effects of Projects; Comments from Public and Public Agencies to Lead Agencies; Availability of Information** (CEQA California Public Resources Code Division 13. Environmental Quality);
- **§ 21005 Information Disclosure Provisions; Noncompliance; Presumption; Findings** (CEQA California Public Resources Code Division 13. Environmental Quality);

CEQA § 21000 Legislative Intent/§ 21001 Additional Legislative Intent

The following are specific clauses/excerpts lifted directly from Sections 21000 and 21001 of the Public Resources Code and are presented here to gain additional perspective and guidance concerning the importance of accurately applying CEQA to all projects under consideration by local jurisdictions in the State of California.

> ***"§ 21000 Legislative Intent***
>
> "The Legislature finds and declares as follows:"
>
> "(a) The maintenance of a quality environment for the people of this state now and in the future is a matter of statewide concern."
>
> "(b) It is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man."
>
> "..."
>
> "..."
>
> "..."
>
> "..."

"(g) It is the intent of the Legislature that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage, while providing a decent home and satisfying living environment for every Californian."

"§ 21001 Additional Legislative Intent

"The Legislature further finds and declares that it is the policy of the state to:"

"(a) Develop and maintain a high-quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state."

"..."

"..."

"(d) Ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions."

"(e) Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations."

"(f) Require governmental agencies at all levels to develop standards and procedures necessary to protect environmental quality."

"(g) Require government agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs and to consider alternatives to proposed actions affecting the environment."

In review of the above sections it is clear that the state Legislature intends that CEQA serve as the primary tool in carefully considering any and all potential impacts associated with a "project" and it's "alternatives" (including a "no project alternative"). What is equally clear is that by making a determination that the project in this case, an ordinance serving to ban so-called "medical marijuana businesses," while knowing that many/most of the cultivation activities associated with the land use are provided for under State Law may only serve in the migration of this land use from "storefronts" throughout the City to "underground" locations. Indeed, many of these new locations will likely be in residential neighborhoods in the City. ,. The City has failed to analyze the potential impacts associated with a shift of this land use into other alternative locations, such as residential neighborhoods. Indeed, patients will gravitate towards residential neighborhoods for the purpose of fulfilling the need to have marijuana medicine easily accessible and the impacts of such a shift should be evaluated before a decision on the proposed project is rendered by the City. By determining that the "project" in this case, a proposed ordinance to ban medical marijuana businesses, is "exempt" from CEQA, no such analysis is being conducted and existing residential neighborhoods throughout the City are unaware of the pending impacts that may result from this action. To assume that the activities associated with the land use in this case will simply go away is neither a reasonable nor an accurate position.

CEQA § 21001.1 Review of Public Agency Projects

"§ 21001.1 Review of Public Agency Projects" reads as follows:

"§ 21001.1 Review of Public Agency Projects"

> "The Legislature further finds and declares that it is the policy of the state that projects to be carried out by public agencies be subject to the same level of review and consideration under this division as that of private projects required to be approved by public agencies."

The above section is included herein to make clear there should be no deference given for how a "project" is processed and reviewed whether it is proposed by a public agency, as the case is here, or by a private entity. In my review of the facts and circumstances surrounding the determination to "exempt" the project from the provisions of CEQA it appears there are some liberties taken to support the City's desire to ban the subject land use.

CEQA § 21002. APPROVAL OF PROJECTS; FEASIBLE ALTERNATIVE OR MITIGATION MEASURES

"§ 21002 Approval of Projects; Feasible Alternative or Mitigation Measures" reads as follows:

> "§ 21002. Approval of Projects; Feasible Alternative or Mitigation Measures"
>
> "The Legislature finds and declares that it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. The Legislature further finds and declares that in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof."

The above section stipulates the importance of truly understanding the project's impacts and any feasible alternatives or feasible mitigation measures available before the project is approved. By failing to conduct an Initial Study in this case, the City has failed to assess or analyze the potential impacts of the proposed ordinance, including feasible alternatives, or mitigation measures (if any). By improperly rendering the project categorically exempt from CEQA, the City has failed to vet the project in terms of impacts when there are clearly potential impacts that will remain with respect to this land use in that regardless of the City's ban, the State still recognizes that collective cultivation of medical marijuana. Knowing that "medical marijuana businesses" are being banned locally and knowing collective cultivation may still be permitted from the State's perspective is certainly cause to study the possible alternatives that may result if the storefront options that are now available are proposed to be removed. Where will this land use occur and what would be the impact associated with the likely alternatives for medical marijuana cooperatives and collectives if they are now forced to operate from residences (or other non-store front locations)? Without CEQA being applied to this proposed ordinance these reasonably foreseeable implications are yet not understood and until they can be measured and analyzed no action on this matter should be taken.

CEQA § 21003.1 Environmental Effects of Projects; Comments from Public and Public Agencies to Lead Agencies; Availability of Information

"§ 21003.1. Environmental Effects of Projects; Comments from Public and Public Agencies to Lead Agencies; Availability of Information" reads as follows:

"§ 21003.1. Environmental Effects of Projects; Comments from Public and Public Agencies to Lead Agencies; Availability of Information"

"The Legislature further finds and declares it is the policy of the state that:"

"(a) Comments from the public and public agencies on the environmental effects of a project shall be made to lead agencies as soon as possible in the review of environmental documents, including, but not limited to, draft environmental impact reports and negative declarations, in order to allow the lead agencies to identify, at the earliest possible time in the environmental review process, potential significant effects of a project, alternatives, and mitigation measures which would substantially reduce the effects."

"(b) Information relevant to the significant effects of a project, alternatives, and mitigation measures which substantially reduce the effects shall be made available as soon as possible by lead agencies, other public agencies, and interested persons and organizations."

"(c) Nothing in subdivisions (a) or (b) reduces or otherwise limits public review or comment periods currently prescribed either by statute or in guidelines prepared and adopted pursuant to Section 21083 for environmental documents, including, but not limited to, draft environmental impact reports and negative declarations."

By the City's determination that the proposed ordinance to ban medical marijuana businesses is "exempt" from CEQA while knowing and admitting that the activity associated with the medical marijuana business (i.e. the collective cultivation of medical marijuana) will continue in some capacity is not a reasonable position with respect to the clear intentions of CEQA's purpose as stipulated above.

CEQA § 21005 Information Disclosure Provisions; Noncompliance; Presumption; Findings

"§ 21005. Information Disclosure Provisions; Noncompliance; Presumption; Findings" reads as follows:

"§ 21005. Information Disclosure Provisions; Noncompliance; Presumption; Findings"

"(a) The Legislature finds and declares that it is the policy of the state that noncompliance with the information disclosure provisions of this division which precludes relevant information from being presented to the public agency, or noncompliance with substantive requirements of this division, may constitute a prejudicial abuse of discretion within the meaning of Sections 21168 and 21168.5, regardless of whether a different outcome would have resulted if the public agency had complied with those provisions."

"(b) It is the intent of the Legislature that, in undertaking judicial review pursuant to Sections 21168 and 21168.5, courts shall continue to follow the established principle that there is no presumption that error is prejudicial."

"(c) It is further the intent of the Legislature that any court, which finds, or, in the process of reviewing a previous court finding, finds, that a public agency has taken an action without compliance with this division, shall specifically address each of the alleged grounds for noncompliance."

The point of including the above is again to stress the importance of thoroughly vetting all the potential impacts that may be associated with the entirety of a "project". In this case we are informed in the City's proposed "exemption narrative" that since the use will be banned there will be no impacts. At the same

time the proposed ordinance also stipulates that most of the activities associated with the subject use will be allowed to continue (i.e. "preserved") under State law. It is this secondary element of the proposal that is ignored and therefore we are left with an incomplete picture of what will/may result from the adoption of this ban.

If the activities associated with this land use, which we know will be permitted to continue pursuant to State law and by this proposed ordinance, is no longer permitted in a storefront environment, where will it be conducted and what will those impacts be? Without conducting a thorough analysis of the "Project" we are unable to understand all the potentially significant impacts that may result from this proposal. This is not consistent with the above statute that requires the disclosure of all relevant information before a decision on the matter is rendered.

Rebuttal Comments on the City's Document entitled: California Environmental Quality Act (CEQA) Narrative: ENV 2012-1273-CE

The following narrative presents both general and specific rebuttals/comments that in total will serve to refute the City's determination that the project, a proposed ordinance that will serve to ban "medical marijuana businesses" throughout the City, is "exempt" from CEQA. In making the determination that the "Project" is "categorically exempt" from CEQA the City has produced a document entitled "California Environmental Quality Act (CEQA) Narrative: ENV 2012-1273-CE". The format of this section of this correspondence will first present the most salient components of said document "ENV 2012-1273-CE", and following each will present some alternative considerations that should result in the City's reconsideration of taking further action on this project without proper environmental analysis.

"ENV 2012-1273-CE": "Project Description"

The initial section of the CEQA narrative document as well as the proposed "Notice of Exemption" includes a project description that is arbitrary, misleading, and significantly vague. The following are the actual project descriptions lifted from both the CEQA narrative document and the proposed "Notice of Exemption" respectively, to describe the project that is the subject of this correspondence.

> **"I. PROJECT DESCRIPTION (CEQA NARRATIVE)**
>
> "An ordinance (Appendix A) repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code in response to recent appellate court decisions concerning regulation of medical marijuana."

> **"DESCRIPTION OF NATURE, PURPOSE, AND BENEFICIARIES OF PROJECT: (Proposed Notice of Exemption)**
>
> "An ordinance repealing and replacing Article 5.1 of Chapter IV of the Los Angeles Municipal Code in response to recent appellate court decisions concerning regulation of medical marijuana."

My general opinion as a professional planner with nearly 20 years of experience working in the public sector for jurisdictions across the State, is that a "Project Description" when published should provide some general and basic information about the subject proposal and not disguise or mislead in any way as to the nature of the project and should clearly, in layman's terms, describe the project. Neither is the case with the project description presented at the outset of the CEQA Narrative document and nowhere

within the proposed "Notice of Exemption" is there any description that informs the public of the true intentions of this project and the proposed ordinance is to actually ban "medical marijuana businesses" outright while at the same time recognizing the activities associated with the subject land use will be allowed to continue, albeit in a new and different manner (e.g. only in "dwelling units" and requiring on-site cultivation within the City of Los Angeles) In the CEQA Narrative document it is not until the reader reaches the last paragraph of section **"II. Project History"** is it clear what the proposed ordinance will actually do.

"ENV 2012-1273-CE": "Project History"

Within the "Project History" section of the CEQA Narrative document the City presents an alleged history of the City's efforts to date to develop "...a comprehensive regulatory framework to balance the unregulated proliferation of medical marijuana businesses, access by seriously ill patients to medical marijuana consistent with State law as codified in the Compassionate Use Act (CUA) and Medical Marijuana Program Act (MMPA), and public safety."

It is important to recognize that the City, in this opening sentence, establishes two important facts:

1. That the subject land use has proliferated across the City and needs to be balanced and regulated; and
2. That any regulations must be consistent with State law and specifically the Compassionate Use Act (CUA) and the Medical Marijuana Program Act (MMPA).

Following the above the City further describes the various court cases and the litigation that has occurred since the adoption of the City's various ordinances to regulate medical marijuana and presents that as the justification to propose the ordinance that will serve to "ban medical marijuana businesses". The City then outlines the exceptions to the definition of "medical marijuana businesses" outlined in the proposed ordinance, notably the exclusion of "any dwelling unit where a maximum of three of fewer qualified persons process or associate to collectively or cooperatively cultivate marijuana on-site."At the conclusion of this section the document reads as follows:

> "The proposed ordinance thereby preserves the limited State law medical marijuana criminal immunities, and does not prohibit seriously ill patients and their primary caregivers from processing and collectively and cooperatively cultivating medical marijuana consistent with State law."

The tantamount question that goes unanswered as well as not even considered or analyzed is the impact created by the creation of small "micro-collectives" located in dwelling units throughout the City (with on-site cultivation) now that storefront medical marijuana collectives are going to be banned As a result of the City's determination to find that this project is "exempt" from CEQA there is no discussion, analysis, alternatives, mitigation investigated and we are left to speculate. A decision on a project should not be made when the direct impacts associated with the project are not quantified and determined to be either significant or otherwise.

An obvious and logical impact as a result of this project would be the creation of small "micro-collectives" located in dwelling units within residential neighborhoods. To not address these potentially significant impacts that are likely to occur as a result of this proposed ban is not consistent with basic CEQA provisions that will be cited specifically later in this correspondence.

"ENV 2012-1273-CE": "Existing Environment"

The essential elements of this section of the City's CEQA Narrative appear to attempt to establish that there are no legally established medical marijuana businesses in the City, due to the fact that the City hasn't processed/implemented their own ordinance which does permit this land use under certain circumstances. It is also made clear in this section that there are some significant number of these businesses currently in existence that are pre-registered with the City and awaiting implementation of the City's processes to regulate the use.

For the City to take from this section that because they themselves have not implemented their own regulations to mean there are no existing "projects/conditions" that establish the baseline for potential impacts for purposes of CEQA is not reasonable or accurate.

One additional statement that the City makes needs to also be highlighted here as well. The first sentence of the final paragraph of this section reads as follows:

> "It has been, and remains, infeasible for the City to undertake to verify that each of the dispensaries on the TUO and Certificate Lists actual physically exist."

Again as a former 20 year public sector planner working in planning departments at jurisdictions across the State, I find this statement to be alarming and in contradiction to my own experiences. A simple physical inspection of each property based on whatever certified list the City has would quickly determine the locations and baselines for CEQA purposes as to the quantifiable number of businesses that would be required to close as a result of the proposed ordinance and therefore provide some indication of the scope of potential impacts that may now occur in other locations as a result.

"ENV 2012-1273-CE": "Environmental Review Under CEQA"/Section 15060(c)(2)

In this section of the CEQA Narrative document the City staff cites Section 15060(c)(2) of the "State CEQA Guidelines" in support of their position that CEQA would not apply to the proposed ordinance. Specifically they cite Section 15060(c)(2) which reads as follows:

> "Section 15060(c)(2) Once an application is deemed complete, a lead agency must first determine whether an activity is subject to CEQA before conducting an initial study, An activity is not subject to CEQA if:"
>
> "..."
>
> "(2) The activity will not result in a direct or reasonably foreseeable indirect physical change in the environment..."
>
> "..."

In support of their finding that Section 15060(c)(2) applies they cite a number of court rulings and rely upon their determination that none of the existing medical marijuana businesses are operating in conformance with the Zoning Code and therefore for purposes of CEQA the existing facilities are purposely excluded from the "environmental baseline". They further stipulate that "because the existing baseline of conditions is that existing medical marijuana businesses are operating in violation of the Zoning Code and the proposed ordinance would specifically make medical marijuana businesses a disallowed activity, the proposed ordinance would have no direct or reasonably foreseeable indirect physical change or impact upon the environment."

Rebuttal Comments on the Application of Section 150602(c)(2)

There are two (2) significant flaws in the City's reasoning outlined above. To state that the existing medical marijuana businesses are operating illegally because they don't meet the requirements of the current ordinance regulating this land use is not correct in that it is my understanding that the reason no current medical marijuana businesses have been issued permits to operate in the City under the MMO and TUO is because the City has chosen not to implement the applicable local law. . In addition, the City has in fact recognized in this same document, that the land use associated with the collective cultivation of medical marijuana will continue, albeit in a new and different manner, (i.e. in dwelling units with onsite cultivation). Again, the City has failed to analyze and mitigate the direct and reasonably foreseeable indirect impacts that will certainly result from the closing of all existing "medical marijuana businesses" and the creation of new "micro-collectives" dispersed throughout the City, including those in single family residential neighborhoods, where most "dwelling units" exist

"ENV 2012-1273-CE": "Environmental Review Under CEQA"/Categorical Exemptions

The City goes onto to cite four (4) specific sections of the Article 19. Categorical Exemptions from the State's CEQA Guidelines. These same sections are also identified in the proposed Notice of Exemption and include the following:

1. **Section 15301. Existing Facilities:** "...the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination."
2. **Section 15305. Minor Alterations In Land Use Limitations:** "...minor alterations in land use limitations in areas with an average slope of less than 20% which do not result in any changes in land use or density, including but not limited to:
    a. Minor lot line adjustments, side yard, and set back variances not resulting in the creation of any new parcel;
    b. Issuance of minor encroachment permits;
    c. Reversion to acreage in accordance with the Subdivision Map Act."
3. **Section 15308. Actions By Regulatory Agencies For Protection Of The Environment:** "...actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption."
4. **Section 15321. Enforcement Actions BY Regulatory Agencies:** "...
    a. Actions by regulatory agencies to enforce or revoke a lease, permit, license, certificate, or other entitlement for use issued, adopted, or prescribed by the regulatory agency or enforcement of a law, general rule, standard, or objective, administered or adopted by the regulatory agency. Such actions include, but are not limited to, the following:
        i. The direct referral of a violation of lease, permit, license, certificate, or entitlement for use or of a general rule, standard, or objective to the Attorney General, District Attorney, or City Attorney as appropriate, for judicial enforcement;
        ii. The adoption of an administrative decision or order enforcing or revoking the lease, permit, license, certificate, or entitlement for use or enforcing the general rule, standard, or objective.

b. Law enforcement activities by peace officers acting under any law that provides a criminal sanction;
c. Construction activities undertaken by the public agency taking the enforcement or revocation action are not included in this exemption."

The following sections present a brief summary of the City's arguments in support of each of the Categorical Exemptions cited above. Following each of the City's arguments is my opinion (rebuttal comments) on their arguments/findings concerning the applicability and use of the cited Categorical Exemptions.

"ENV 2012-1273-CE": Section 15301. Existing Facilities

The City supports the citing of this section by claiming that the proposed ordinance would only impact existing medical marijuana businesses. They further claim that as a result of the proposed ban on medical marijuana businesses those uses would cease to exist and only those uses permitted by the applicable zoning ordinance would then move into the vacated locations. Typically the City would be correct in this application as most potential land uses impacts associated with uses that are permitted by right are exempt not only by this type of Categorical Exemptions but also as a Statutory Exemption.

Rebuttal Comments on the Application of Section 15301

The significant flaw in the City's proposal to cite this Class of Categorical Exemption is that it does not accurately represent the totality of the reasonably foreseeable impacts that may occur as a result of this project. If the proposed ordinance serves to ban the medical marijuana "store front/business" but at the same time acknowledges the activities associated with this previous use will still be permitted to occur pursuant to State Law (albeit in a new way - primarily in dwelling units with onsite cultivation composed of three or fewer persons) what will be the impacts? It is this component that makes Section 15301 inapplicable. The activities associated with this land use will now occur almost exclusively in residential environments and to characterize the activities associated with this land use as a "minor alteration of public private structures... involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination" when applied to a single family residential environment would be grossly inaccurate and not a reasonable application of this categorical exemption. The potential impacts associated with the "how and where" that will remain even after the proposed ban must be answered in terms of CEQA before the proposed ordinance that will create these potentially significant impacts to existing residential environments must be answered.

"ENV 2012-1273-CE": Section 15305. Minor Alterations In Land Use Limitations

The City supports the application of this section by stating "the proposed ordinance will prohibit an activity that is not enumerated in the Zoning Code." They further stipulate that the proposed ordinance will not result in any changes in land use because the ultimate result is that the same uses that are allowed prior to the adoption of the proposed ordinance would still be permitted after the ordinance is adopted. They conclude their argument for the application of this class of exemption by stating the following.

> "...The ultimate result is that the exact same enumerated uses that are allowed prior to the adoption of the proposed ordinance would be permitted after the adoption of the proposed ordinance. Therefore, the baseline of existing conditions will have a net result of being the same after the proposed ordinance is adopted."

Rebuttal Comments on the Application of Section 15305

"Section 15305. Minor Alterations In Land Use Limitations" prescribes specific project types to characterize the scenarios under which this class of project should be cited. The following are the types of projects cited in the state guidelines that qualify for this category of exemption:

a. Minor lot line adjustments, side yard, and set back variances not resulting in the creation of any new parcel;
b. Issuance of minor encroachment permits;
c. Reversion to acreage in accordance with the Subdivision Map Act."

The "Project" in this case, a proposed ordinance that will ban a land use type from its current locations but at the same time recognize that the land use activities associated with the subject land use (which includes cultivation of marijuana) can continue albeit in a new and different form, is nothing remotely similar to this category of project types. This section specifically excludes those projects which would result in any changes in land use, which is exactly what this proposed ordinance will do. This categorical exemption is in no way appropriate or applicable to a project that will affect land use in the obvious way this project does and should not be cited in support of the City's determination that this project is exempt from CEQA.

"ENV 2012-1273-CE": Section 15308. Actions By Regulatory Agencies For Protection Of The Environment

The City presents a number of claims that this action will serve to "protect the environment" and therefore is qualified to cite this class of categorical exemption. The following is a brief summary of the City's narrative/justifications for citing this section:

- "It enhances the environment by prohibiting rather than authorizing medical marijuana businesses as required by the ruling in *Pack*....The *Pack* court ruled that cities may enact prohibitions that restrict and limit medical marijuana businesses but may not enact affirmative regulations that permit or authorize such businesses. The proposed ordinance is in conformity with public necessity and protection of the environment where the regulatory process involves procedures for protection of the environment in that it maintains conformity with the *Pack* rulings.";
- "It protects the environment by banning an activity that is associated with criminal activity....By banning medical marijuana businesses, the proposed ordinance maintains the health and safety of the environment which therefore protects the environment";

- "...The proposed ordinance promotes protection of the environment because it prevents the continuing drain of litigation and police services; and"
- "It assures the maintenance and protection of the environment by not changing access to and cultivation for personal use of medical marijuana by qualified patients, persons with an identification card, or primary caregivers, consistent with State law. Under the proposed ordinance, qualified patients, persons with an identification card, or primary care givers will continue to have access to medical marijuana consistent with State law as codified in the CUA and MMPA...."

Rebuttal Comments on the Application of Section 15308

There are three (3) significant comments on the City's arguments above that clearly remove the application of this category of exemptions to this project.

1. The City clearly claims that this land use (the cultivation of medical marijuana) and the activities associated with it has the potential for associated criminal activities;
2. The City also claims that this project will prevent the continuing drain of litigation and police services; and
3. They again acknowledge that the land use activities associated with this land use will continue via State law.

For all the reasons above this project is not exempt from CEQA pursuant to this class of projects. If the City alleges that the land use at issue has some potentially significant impacts (e.g. alleged criminal activities) and the use will now be required to take place in dwelling units (with onsite cultivation), the City is obligated to investigate the reasonably foreseeable impacts that result from the proposed ordinance as it now impacts this land use (cultivation of medical marijuana) by banning"storefront medical marijuana businesses". Again we are left to speculate on how the relocation of the activities associated with this land use (cultivation of medical marijuana) will impact the City without conducting a thorough analysis, via CEQA, of the foreseen land use impacts as the City cites above.

"ENV 2012-1273-CE": Section 15321. Enforcement Actions BY Regulatory Agencies

The City supports the application of this categorical exemption with the following remarks:

> "The proposed ordinance would be the adoption of an order enforcing a law, general rule, standard and objective administered and/or adopted by the City because it confirms and restores the rule of law, expressed by the City's Zoning Code and the *Pack* court...Further, the proposed ordinance exempts from the definition of medical marijuana business, locations and vehicles used in strict conformity with State law...."

The question that the City does not answer is simply this, what are the impacts that could result from the proposed ordinance that serves to allow the activities associated with medical marijuana collectives, cooperatives in terms of future locations and vehicles used provided for in the proposed ordinance and in strict conformity with State law. Clearly there will be impacts associated with this land use going forward, as the City itself has asserted, and if this proposed ordinance permits these activities (albeit in a new and different manner) they are obligated to address these potential impacts via CEQA. The class of projects that is cited by the City here is simply a misapplication of this category as it was intended. The intention for citing that a project falls within this class of projects is to allow the jurisdiction some relief from CEQA when dealing with matters concerning singular projects that are noncompliant with their conditions of approval or other permit requirements.

"ENV 2012-1273-CE": "Exceptions To The Use Of Categorical Exemptions"

In this section of the CEQA Narrative document the City's planning staff presents their arguments in support of their finding that "Section 15300.2 Exceptions" does not apply and therefore the project is exempt from CEQA. The following is a brief summary of each of their arguments followed by my rebuttal comments:

> "A. Cumulative Impact. The exception applies when, although a particular project may not have a significant impact, the impact of successive projects, of the same type, in the same place, over time is significant."

The City argues that the above "exception" is not applicable because, "There are no successive projects of the same type planned for the City of Los Angeles." They also stipulate that any impact from the proposed ordinance is negligible or close to *de minimis*, so that any incremental effect would not be cumulatively considerable. They further state that any existing medical marijuana business is not an authorized land use and therefore the proposed ordinance does not result in additional uses after its adoption.

Rebuttal Comments on Applicability of Section 15300.2(a) Cumulative Impact Exception

Although I agree in principle with the City's conclusion that this exception section/category is not necessarily applicable, I do not agree with the remarks the City staff makes in there characterization of the project, that is the subject of this matter. Specifically, they claim the impact from the proposed ordinance is "negligible or close to *de minimis*". They fail again to recognize and address that this ordinance also recognizes that this land use and all the potentially significant issues that come with it will in fact be permitted under this proposed ordinance albeit in a new and different manner at potentially thousands of locations throughout the City.

"ENV 2012-1273-CE": "Exceptions To The Use Of Categorical Exemptions" Significant Effect Due to Unusual Circumstances

The following is the specific language of Section 15300.2 (b) :

> "This exception applies when, although the project may otherwise be exempt, there is a reasonable possibility that the project will have a significant effect due to unusual circumstances. Examples include projects which may affect scenic or historical resources."

The City staff supports that this exception is not applicable based upon the following:

> "There is no reasonable possibility that the proposed ordinance will have a significant effect due to unusual circumstances. As demonstrated above, there is nothing about any impacts associated with the proposed ordinance that differ from general circumstances of the exemptions listed. There is no unusual concentration of existing medical marijuana businesses; they occur throughout the City. Therefore, the prohibition of such activity will not cause an impact due to unusual circumstances when an entire city is impacted en masse by this proposed ordinance. "
>
> "Additionally... any impact from the proposed ordinance is less than significant."
>
> "Finally, the proposed ordinance will not have a significant effect on medical marijuana businesses that cease to operate as qualified patients, persons with an identification card, and primary caregivers will continue to access medical marijuana at locations

throughout the City consistent with the CUA and MMPA. Qualified persons, within limited restrictions relating to large-scale growing operations, can also continue to cultivate medical marijuana for their personal use consistent with the CUP and MMPA."

Rebuttal Comments on Applicability of Section 15300.2(b) Significant Effect Due to Unusual Circumstances

It appears that the City's justification for not citing this clearly applicable "exception", is simply based on the following statement, "...any impact from the proposed ordinance is less than significant." Without question, there is ample evidence throughout this correspondence that substantiates the conclusion that there will be reasonably foreseeable direct and indirect impacts resulting from this project but regardless of the strong evidence presented herein there is certainly extremely "unusual circumstances" surrounding this project that clearly apply. The City's arguments that this exception does not apply is simply wrong. The alleged fact that there is not a concentration of existing medical marijuana businesses is irrelevant. The fact that the City believes there are no impacts associated with this project is irrelevant to this exception because of the extremely unusual circumstances surrounding this land use. The fact that the project will ban medical marijuana businesses (as currently defined) and at the same time allow the continued activities associated with this land use to continue albeit in a new and different form (i.e. dwelling units with onsite cultivation) under the provisions of State law is extremely unusual and therefore demands that this exception be cited and the CEQA process applied.

"ENV 2012-1273-CE": "Exceptions To The Use Of Categorical Exemptions" Scenic Highway

I concur with the City's conclusion that this "exception" is not applicable, but again I do not agree with some of their characterizations in support of their finding with respect to this category of "exception".

Rebuttal Comments on Applicability of Section 15300.2(c) Scenic Highway

Specifically the City's following remark, "...The proposed ordinance merely affects operation within existing structures that are already built out...." is not an accurate representation of all the activities associated with this land use that will be permitted to continue albeit in a new and different manner pursuant to both the proposed ordinance and State law. This characterization completely ignores the "cultivation" activities which will continue as a result of this project, in dwelling units with required onsite cultivation, pursuant to the proposed ordinance and these activities could result in significant impacts to some locations yet undetermined and not analyzed. Again, the activities that will continue as a result of this proposed ordinance related to "cultivation" need to be analyzed.

"ENV 2012-1273-CE": "Exceptions To The Use Of Categorical Exemptions" Hazardous Waste Site

The City's conclusion that this "exception" is not applicable is not entirely unsubstantiated but again I do not agree with some of their characterizations in support of their finding with respect to this category of "exception".

Rebuttal Comments on Applicability of Section 15300.2(c) Hazardous Waste Site

Specifically the City's following remark, "...The proposed ordinance merely affects operation within existing structures that are already built out...." is not an accurate representation of all the activities associated with this land use that will be permitted to continue albeit in a new and different form pursuant to both the proposed ordinance and State law. This characterization completely ignores the "cultivation" activities which will continue as a result of this project, in dwelling units throughout the City, pursuant to the proposed ordinance and these activities could result in significant impacts to some

locations yet undetermined and not analyzed. Cultivation of marijuana plants could involve significant amounts of hazardous waste and this potential impact needs to be analyzed.

"ENV 2012-1273-CE": "Exceptions To The Use Of Categorical Exemptions" Historical Resources

The City's conclusion that this "exception" is not applicable is not entirely unsubstantiated but again I do not agree with some of their characterizations in support of their finding with respect to this category of "exception".

Rebuttal Comments on Applicability of Section 15300.2(c) Historical Resources

Again the City's remark, "...The proposed ordinance merely affects operation within existing structures that are already built out...." is not an accurate representation of all the activities associated with this land use that will be permitted to continue albeit in a new and different manner pursuant to both the proposed ordinance and State law. As a consequence of not conducting a thorough analysis pursuant to CEQA it is not known if future locations where the activities associated with this land use will still be allowed would impact historical resources. Since we do not know where these future facilities will be located, we don't know how historical resources may be impacted. If the City were to conduct the proper CEQA analysis any potential impacts to historical resources that may occur as a result of this proposed ordinance could be thoughtfully identified and mitigated. Without the benefit of the appropriate analysis offered by CEQA we again are left to speculate.

"ENV 2012-1273-CE": "Additional Factual Support"

The remainder of the CEQA Narrative document prepared by the City presents a very unusual /atypical analysis that they claim further supports their conclusions that the project is exempt from the provisions of CEQA. They essentially conduct a modified or "faux" "Initial Study" for the project as if the project was not exempt. They provide various arbitrary arguments for each of the standard component parts to the State's "Initial Study Checklist" but the explanations are again very limited and don't truly evaluate the project in terms of each of the component sections of a "real" "Initial Study". They present little or no analysis of the entirety of the proposal and specifically ignore the elements of the proposed ordinance that prescribe that many of the activities associated with medical marijuana collectives, cooperatives, and the cultivation and dispensing of marijuana will still occur as a result of this ordinance but make no real effort to quantify the impacts of these activities and as a result do not identify potential mitigation or alternatives that would be required for projects going forward.

A formal "Initial Study Checklist" provides a very detailed list of questions associated with each of the component parts of the checklist that provoke a thorough vetting of the potential impacts. The City's "pseudo/faux" "Initial Study" simply doesn't provide the depth or identify any alternatives to this "Project" or any mitigation that may be necessary that is typical when conscientious analysis consistent with the professional planning community is applied. Rather than presenting a comprehensive response to each of the marginal/incomplete arguments provided by the City it is safe to say they should endeavor to actually conduct the analysis this project requires for all the reasons stipulated within this correspondence.

Another reason to require that the City actually conduct an "Initial Study" and apply CEQA to this project is to provide all with the opportunity to comment on the document and the analysis presented which will further ensure that the most complete analysis is conducted. The application of CEQA will ultimately serve to better inform the decision makers and the public to ensure that all the potential impacts

associated with this proposed ordinance are considered in the debate and decision making process that will occur on this matter in the near future.

Please carefully consider the recommendations prescribed herein as they are consistent with how CEQA is intended and required to be applied on projects that will result in reasonably foreseeable direct and indirect impacts and that carry with them such "unusual circumstances" as does this project. The City has supported their determination that this project is exempt from CEQA by only focusing on the proposed ban of this land use. The fact is the proposed ordinance will also allow many of the activities associated with this land use to also continue albeit in a new and different form (and with new restrictions such an mandated onsite cultivation) and it is this element that the City must also consider in much greater detail and the application of CEQA to the entirety of this "Project" will provide us with the complete picture of potential impacts and in turn possible alternatives and mitigation as required.

Sincerely,

s/Sean Scully
Principal, Planning & Permit Technologies, Inc.

T: (818) 426-6028
F: (310) 373-0011
E-mail: permittech@verizon.net

Exhibit 5

Channel Law Group, LLP

207 E. BROADWAY
SUITE 201
LONG BEACH, CA 90802

Phone: (310) 982-7197
www.channellawgroup.com

ROBERT JYSTAD
JULIAN K. QUATTLEBAUM, III *
JAMIE T. HALL **
CHARLES McLURKIN

*ALSO Admitted in Colorado
**ALSO Admitted in Texas

Writer's Direct Line: (310) 982-1760
jamie.hall@channellawgroup.com

June 21, 2012

VIA PERSONAL DELIVERY

Council President Wesson and
Members of the Los Angeles City Council
City of Los Angeles
200 N. Sprint Street, Room 340
Los Angeles, CA 90012

Re: Council File 11-1737-S1 re Los Angeles Medical Marijuana Ordinance; Compliance with California Environmental Quality Act

Dear President Wesson and Council members:

This firm represents the Union of Medical Marijuana Patients ("UMMP") and Arts District Patients Collective, Inc. d/b/a Arts District Healing Center ("ADHC") with respect to the City of Los Angeles' ("City") proposed new medical marijuana ordinance ("Ordinance") banning so-called "medical marijuana businesses." On June 8, 2012, a detailed Analysis was filed with the City Clerk outlining the environmental effect of the proposed Ordinance. The Analysis concluded that the Ordinance was not exempt from the California Environmental Quality Act ("CEQA"). This letter outlines additional foreseeable environmental effects associated with the proposed Ordinance requiring review and mitigation under CEQA.

The Proposed Ordinance

In 2007, the City adopted Interim Control Ordinance ("ICO)" No. 179027, which prohibited the establishment of new medical marijuana collectives until such time as a permanent ordinance could be adopted. Significantly, the City broadly defined the prohibited activity. The City defined a "Medical Marijuana Dispensary" as follows: "**any** use, facility, or **location**, including but not limited to a retail store, office building, or structure **that distributes, transmits, gives, dispenses, facilitates or otherwise provides marijuana in any manner**, in accordance with State law, in particular, California Health and Safety Code Sections 11362.5 through 11362.83, inclusive." (emphasis added). A total of 219 medical marijuana collectives registered with the City under the ICO.

In 2010, the City adopted permanent Medical Marijuana Ordinance ("MMO") No. 181069. Section 45.19.6.1(B) of the MMO defined a "Medical Marijuana Collective" as follows: "An incorporated or unincorporated association, composed solely of four of more qualified patients, persons with identification cards, and designated primary caregivers of qualified patients and persons with identification cards . . . who associate at a particular location to collectively or cooperatively cultivate marijuana for medical purposes, in strict accordance with California Health and Safety Code Sections 11362.5. *et seq.*" No permits or "registrations" were issued by the City under the MMO and the City subsequently adopted Temporary Urgency Ordinance No. 181530, which amended the MMO to comply with court order.

The City's proposed Ordinance bans "medical marijuana businesses," which are defined in the draft ordinance as either of the following: "(1) Any location where marijuana is cultivated, processed, distributed, delivered or given away to a qualified patient, a person with an identification card, or a primary caregiver. (2) Any vehicle or other mode of transportation, stationary or mobile, which is used to transport, distribute, deliver, or give away marijuana to a qualified patient, a person with an identification card, or a primary caregiver." *See* Section 45.19.6.1(1)-(2). However, the proposed ordinance specifically excludes from the definition "Any **dwelling unit** where a maximum of three (3) or fewer qualified patients, persons with an identification card, and/or primary caregivers process or associate to **collectively or cooperatively cultivate marijuana on-site** for their own personal medical use or, with respect to the primary caregivers, for the personal medical use of the qualified patients or persons with an identification card who have designated the individual as a primary caregiver, in accordance with California Health and Safety Code Sections 11362.5 and 113621 et seq.;" *See* Section 45.19.6.1(3)(a) (emphasis added). Notably, the proposed ordinance requires all cultivation of medical marijuana to be conducted on-site within the City of Los Angeles and only allows medical marijuana collectives of less than four persons in "dwelling units."

Environmental Baseline

The CEQA Narrative ("Narrative") prepared by the Planning Department (ENV 2012-1273-CE) erroneously concludes that "the environmental baseline currently consists of no legally entitled medical marijuana business that the proposed ordinance will now restrict." Narrative at 5. The Narrative further states that "because currently no medical marijuana businesses are operating in conformance with the Zoning Code and should not be existing under the law, for purposes of CEQA the City exercise[s] its discretion to exclude them from the environmental baseline." *Id.* However, the legality of the existing medical marijuana collectives in the City does not relieve the City of the obligation to include them in the environmental baseline. In *Riverwatch v. County of San Diego* (1999) 76 Cal. App.4th 1428, 1451, the court held that the proper baseline is the existing condition of the site, even if that condition may be the result of prior illegal activity. The court explained in *Riverwatch* that CEQA is not "the appropriate forum for determining the nature and consequence of a prior consequence of a prior conduct of a project applicant." 76 Cal. App.4th at 1452. The decision in *Riverwatch* has been followed by other courts. *See Eureka Citizens for Responsible Government v. City of Eureka* (2007) 147 Cal. App. 4th 357, 370 (citing *Riverwatch* and stating that the "environmental impacts should be examined in light of the environment as it exists when a project is approved.").

Moreover, it is a fundamentally accepted principle that environmental impacts should be examined in light of the environment as it exists when a project is approved. (Guidelines, § 15125, subd. (a); *Bloom v. McGurk* (1994) 26 Cal. App. 4th 1307, 1315, fn. 2; *City of Carmel-by-the-Sea v. Board of Supervisors* (1986) 183 Cal. App. 3d 229, 246; *Christward Ministry v. Superior Court* (1986) 184 Cal. App. 3d 180, 190; *Environmental Planning & Information Council v. County of El Dorado* (1982) 131 Cal. App. 3d 350, 358; Remy et al., Guide to the Cal. Environmental Quality Act (10th ed. 1999) p. 165.). In this case, there are at least 372 medical marijuana collectives in the City that have obtained tax registration certificates as of November 1, 2011, many of which the City has regulated and taxed for over 6 years. To exclude the consideration of these collectives on the basis that they are operating in violation of zoning code is an abuse of discretion and not supported by substantial evidence.

The City Has Failed to Consider Significant Environmental Impacts of New Cultivation Requirement

The Ordinance establishes several new legal requirements that did not previous exist under either the MMO or TUO. Notably, the Ordinance requires all cultivation of medical marijuana to be conducted on-site within the City of Los Angeles and only allows medical marijuana collectives of less than four persons in "dwelling units." Section 45.19.6.1(3)(a). Neither the MMO nor TUO required cultivation to take place in the City of Los Angeles or in a "dwelling unit," something that is not required under state law. Further, *City of Lake Forest v. Evergreen Holistic Collective* (4th Dist. 2012) 203 Cal.App.4th 1413, which held that cultivation was required to take place "on-site," has been accepted for review by the California Supreme Court and not citable pursuant to California Rules of Court. *Lake Forest, City of v. Evergreen Holistic Collective,* 2012 Cal. LEXIS 4728 (Cal. May 16, 2012). Currently, the medical marijuana used by existing qualified patients in the City of Los Angeles is not exclusively cultivated in the City of Los Angeles. The City has completely failed to address the significant environmental effects associated with this new requirement. The environmental impacts associated with indoor cultivation are significant and profound. A recent study entitled *The Carbon Footprint of Indoor Cannabis Production*, published in *The International Journal of the Political, Economic, Planning, Environmental and Social Aspects Energy*, detailed the environmental impacts of indoor cannabis cultivation (Exhibit 1). The following are highlights from the study:

- Indoor cannabis production utilizes highly energy intensive processes to control environmental conditions during cultivation.

- Indoor cannabis production results in energy expenditures of $6 billion each year--6-times that of the entire U.S. pharmaceutical industry--with electricity use equivalent to that of 2 million average U.S. homes. This corresponds to 1% of national electricity consumption or 2% of that in households.

- One average kilogram of cannabis is associated with 4600 kg of carbon dioxide emissions (greenhouse-gas pollution) to the atmosphere, or that of 3 million average U.S. cars when aggregated across all national production.

- In California, the top-producing state, indoor cultivation is responsible for about 3% of all electricity use or 9% of household use.

- The unchecked growth of electricity demand in this sector confounds energy forecasts and obscures savings from energy efficiency programs and policies.

- Shifting cultivation outdoors can nearly eliminate energy use for the cultivation process.

This study was the product of previous research conducted by the same author (Exhibit 2). The Narrative completely fails to analyze any of the reasonably foreseeable impacts of the Ordinance's cultivation requirement in "dwelling units." The Ordinance is not exempt from CEQA and there are significant environmental impacts, as outlined the aforementioned studies, that the City has failed to mitigate.

Environmental Impacts of Forced Closure of Existing Medical Marijuana Collectives in City

The City has failed to consider the impacts associated with the closure of the hundreds of existing medical marijuana collectives in the City and the significant environmental impacts associated with the creation of thousands of smaller, "micro-collectives" comprised of three or fewer persons in "dwelling units." Initially, it is important to understand that a project, or in this case the adoption of a new ordinance, need not directly effect a physical change in the environment: reasonably foreseeable indirect or secondary effects must also be analyzed. The relative inquiry is whether or not the project will ultimately culminate in physical changes to the environment. As described below, the Ordinance will unquestionably culminate in a physical change to the environment if existing medical marijuana collectives are compelled by the City to close and replaced by thousands of small, "micro-collectives" cultivating within the City limits in "dwelling units." The City has completely failed to analyze the impacts of both the forced closure of existing collectives and the establishment of new "micro-collectives."

The environmental impacts of the Ordinance could be profound. The environmental factors that the City is compelled to consider include the following: (1) Aesthetics, (2) Agriculture and Forestry, (3) Air Quality, (4) Biological Resources, (5) Cultural Resources, (6) Geology / Soils, (7) Greenhouse Gas Emissions, (8) Hazards & Hazardous Materials, (9) Hydrology / Water Quality, (10) Land Use / Planning, (11) Mineral Resources, (12) Noise, (13) Population / Housing, (14) Public Services, (15) Recreation, (16) Transportation/Traffic, and (17) Utilities / Service Systems. While the Ordinance may not have a significant effect on the environment with respect to one particular environmental factor (e.g. Mineral Resources), it may nonetheless have a significant environmental effect on another factor (e.g. Transportation / Traffic). Without conducting an Initial Study and providing an opportunity for stakeholders to formally comment, the City has no way of knowing the effects on the environment. The Narrative prepared by the Planning Department is an inadequate substitute to the completion of an Initial Study.

Forcing all medical marijuana collectives in the City of Los Angeles to close will create thousands of small, "micro-collectives." Patients that currently are members of established medical marijuana collectives will be required to establish new, albeit much smaller, "micro-collectives" comprised of three of fewer persons, and will be required to cultivate marijuana in "dwelling units." There are reasonably foreseeable environmental consequences that implicate agriculture, air quality, water quality, traffic, land use planning, etc. Consider the following facts:

- Assuming medical marijuana patients comprise 2% of the Los Angeles population then there are 76,987 patients in Los Angeles.
- Since only collectives of three or fewer persons will be authorized under the Ordinance, at least 25,662 "micro-collectives" will need to be established to meet patient needs in the City of Los Angeles.
- Assuming patients use 1 ounce of marijuana per month, then 57,740 pounds of cannabis per year would need to be cultivated to meet patient needs in the City of Los Angeles.

The establishment of thousands of new "micro-collectives" and the cultivation of medical marijuana in "dwelling units," including single family residential zones, implicate significant environmental concerns and require meaningful review under CEQA. Obviously, cultivation sites will proliferate as a result of the Ordinance and additional waste water will be created as a result of these cultivation activities. Moreover, additional waste plant material (a.k.a bio-waste) will be created that must be disposed of properly. However, because these activities must take place in "dwelling units," the proper means of disposal is unclear and the City has failed to mitigate the foreseeable environmental impacts. Further, and as noted above, there will also be an increase in the electrical consumption that will be required. These facts are compelling and demonstrate potential significant environmental effects in terms of (1) Greenhouse Gas Emissions, (2) Hazards & Hazardous Materials, (3) Hydrology / Water Quality, and (4) Utilities / Service Systems.

Moreover, there are transportation/traffic and air quality issues that are implicated as well. It is undisputed that the Ordinance will require hundreds of existing medical marijuana collectives to close and create thousands of "micro-collectives" throughout the City. The Ordinance will also have another intended consequence – it will cluster these smaller "micro-collectives" within the areas of the City where "dwelling units" exist, including single family residential zones. There are significant environmental concerns associated with the cultivation of almost all medical marijuana in "dwelling units," as required by the Ordinance. Further, as previously noted, the City did not require all cultivation to place in the City under the MMO and TUO. Moreover, the City did not require cultivation to take place exclusively in "dwelling units." Indeed, the City established "buffer zones" to ensure that such activities were kept a certain distance away from "sensitive uses." The Ordinance, however, completely eliminates such a requirement and the City has erroneously determined that the proposed action "will not result in a direct, or reasonably foreseeable indirect physical change in the environment." The establishment of new "micro-collectives" in residential zones creates significant environment impacts that the City has failed to mitigate, including, for example, the significant increases in electrical and water consumption required by cultivation in "dwelling units," the potentially hazardous waste associated with fertilizing and harvesting marijuana plants, and the odor associated with cultivation. Allowing larger groups of people to collectively cultivate medical marijuana provides for economies of efficiency that can reduce the inevitable environmental impacts of an inherently agricultural activity. Further, allowing such activities to take place outside "dwelling units" can reduce environmental impacts. City has failed to mitigate the impacts associated with the Ordinance to ensure that they are "less than significant."

Further, the City has failed to consider the traffic impacts associated with the closure of existing collectives and the establishment of thousands of smaller "micro-collectives." Because collectives are necessarily comprised of patients and caregivers that live in the community (and presumably in residential areas), these individuals (who have a medical need) may have to travel much further to visit

their "micro-collective" of which they are a member. Patients will likely travel by car or public transit. Also, those patients that were previously within walking distance of their collective must now drive or use public transit to visit their new "micro-collective." In essence, the closure of existing collectives and the establishment of thousands of new "micro-collectives" turn certain patients into commuters. Further, significant land use/planning impacts may result from the Ordinance. The creation of thousands of new "micro-collectives" in areas of the City where "dwelling units" exist (such as single family residential zones) creates land use compatibility problems that the City is compelled to analyze under CEQA. There are also environmental concerns in the form of "Public Services." Collectives are inherently formed for the collective cultivation of medical marijuana and are comprised of patients with medical needs. Patient member services (which span the gamut and are often designed for healing) will be impacted when existing collectives are forced to close and destroyed. This could have an effect on "public services."

Finally, there are cultural resources that the City must consider under CEQA. Existing medical marijuana collectives are communities made up of patients and caregivers. A collective is NOT about the mere distribution and cultivation of medical marijuana. For example, ADHC offers a range of patient member services, including (1) Live Music, (2) Organic Food, (3) Community Gardening, (4) Art, and (5) Counseling. Both patients and healing practitioners visit ADHC to assist patients who are experiencing medical problems. ADHC also has a gallery and curator. Artists often come from the local community, but also include patients. Counseling is also provided such as acupuncture, tax advice, and emotional counseling. Much like a church is much more than just a place to worship, a collective is more than a place for the collective cultivation of marijuana. On the contrary, a wide range of patient members services are offered at many collectives and communities have developed around these collectives. An Ordinance requiring the closure of all existing medical marijuana collectives threatens to destroy this community. Local artists would not have ADHC has a venue to display work and, most importantly, an established piece of the local community for over 6 years would simply disappear. Any ordinance that threatens to shut down a patient organization is disrupting the culture that has developed within these collectives. This would certainly impact cultural resources and requires review under CEQA.

Conclusion

While the above discussion is not intended to be an exhaustive list of the reasonably foreseeable indirect or secondary effects of the Ordinance, it is illustrative of the types of impacts that the City must analyze. A fair argument has been outlined regarding the significant environmental effects of the Ordinance. As such, the City is compelled to prepare an Initial Study pursuant to §15063 of the California Public Resources Code as there are no applicable exemptions established in Division 13, Articles 18 or 19 of the California Public Resources Code. The Narrative prepared by Planning Department is an inadequate substitute to an Initial Study and is seriously flawed. Moreover, even if the Narrative were an adequate substitute to an Initial Study, as demonstrated in the instant letter and previous Analysis filed with the City Clerk, the Ordinance will have a significant effect on the environment and the City has failed to mitigate these impacts as required under CEQA. As such, the City is required to prepare an Environmental Impact Report. CEQA Guidelines, § 15002, subd. (k); *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68, 74 (If the initial study shows that the project may have a significant effect, the lead agency takes the third step and prepares an Environmental Impact Report.)

Sincerely,

Jamie T. Hall
Attorney for Union of Medical Marijuana Patients and Arts District Healing Center

Energy Policy ■ (■■■■) ■■■–■■■

Contents lists available at SciVerse ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

The carbon footprint of indoor *Cannabis* production

Evan Mills

Energy Associates, Box 1688, Mendocino, CA 95460, United States

ARTICLE INFO

Article history:
Received 7 September 2011
Accepted 10 March 2012

Keywords:
Energy
Buildings
Horticulture

ABSTRACT

The emergent industry of indoor *Cannabis* production – legal in some jurisdictions and illicit in others – utilizes highly energy intensive processes to control environmental conditions during cultivation. This article estimates the energy consumption for this practice in the United States at 1% of national electricity use, or $6 billion each year. One average kilogram of final product is associated with 4600 kg of carbon dioxide emissions to the atmosphere, or that of 3 million average U.S. cars when aggregated across all national production. The practice of indoor cultivation is driven by criminalization, pursuit of security, pest and disease management, and the desire for greater process control and yields. Energy analysts and policymakers have not previously addressed this use of energy. The unchecked growth of electricity demand in this sector confounds energy forecasts and obscures savings from energy efficiency programs and policies. While criminalization has contributed to the substantial energy intensity, legalization would not change the situation materially without ancillary efforts to manage energy use, provide consumer information via labeling, and other measures. Were product prices to fall as a result of legalization, indoor production using current practices could rapidly become non-viable.

1. Introduction

On occasion, previously unrecognized spheres of energy use come to light. Important historical examples include the pervasive air leakage from ductwork in homes, the bourgeoning energy intensity of computer datacenters, and the electricity "leaking" from billions of small power supplies and other equipment. Intensive periods of investigation, technology R&D, and policy development gradually ensue in the wake of these discoveries. The emergent industry of indoor *Cannabis* production appears to have joined this list.[1]

This article presents a model of the modern-day production process – based on public-domain sources – and provides first-order national scoping estimates of the energy use, costs, and greenhouse-gas emissions associated with this activity in the United States. The practice is common in other countries but a global assessment is beyond the scope of this report.

2. Scale of activity

The large-scale industrialized and highly energy-intensive indoor cultivation of *Cannabis* is a relatively new phenomenon, driven by criminalization, pursuit of security, pest and disease management, and the desire for greater process control and yields (U.S. Department of Justice, 2011a; World Drug Report, 2009). The practice occurs across the United States (Hudson, 2003; Gettman, 2006). The 415,000 indoor plants eradicated by authorities in 2009 (and 10.3 million including outdoor plantations) (U.S. Department of Justice, 2011a, b) presumably represent only a small fraction of total production.

Cannabis cultivation is today legal in 15 states plus the District of Columbia, although it is not federally sanctioned (Peplow, 2005). It is estimated that 24.8 million Americans are eligible to receive a doctor's recommendation to purchase or cultivate *Cannabis* under existing state laws, and approximately 730,000 currently do so (See Change Strategy, 2011). In California alone, 400,000 individuals are currently authorized to cultivate *Cannabis* for personal medical use, or sale for the same purpose to 2100 dispensaries (Harvey, 2009). Approximately 28.5 million people in the United States are repeat consumers, representing 11% of the population over the age of 12 (U.S. Office of National Drug Control Policy, 2011).

Cultivation is also substantial in Canada. An estimated 17,500 "grow" operations in British Columbia (typically located in residential buildings) are equivalent to 1% of all dwelling units Province-wide, with an annual market value of $7 billion (Easton, 2004).

Official estimates of total U.S. *Cannabis* production varied from 10,000 to 24,000 metric ton per year as of 2001, making it the nation's largest crop by value at that time (Hudson, 2003; Gettman, 2006). A recent study estimated national production at far higher levels (69,000 metric ton) (HIDTA, 2010). Even at the

E-mail address: evanmills1@gmail.com

[1] This article substantively updates and extends the analysis described in Mills (2011).

0301-4215/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.enpol.2012.03.023

lower end of this range (chosen as the basis of this analysis), the level of activity is formidable and increasing with the demand for *Cannabis*.

No systematic efforts have previously been made to estimate the aggregate energy use of these activities.

3. Methods and uncertainties

This analysis is based on a model of typical *Cannabis* production, and the associated energy use for cultivation and transportation based on market data and first-principals buildings energy end-use modeling techniques. Data sources include equipment manufacturer data, trade media, the open literature, and interviews with horticultural equipment vendors. All assumptions used in the analysis are presented in Appendix A. The resulting normalized (per-kilogram) energy intensity is driven by the effects of indoor-environmental conditions, production processes, and equipment efficiencies.

Considerable energy use is also associated with transportation, both for workers and for large numbers of small-quantities transported and then redistributed over long distances before final sale.

This analysis reflects typical practices, and is thus intended as a "central estimate". While processes that use less energy on a per-unit-yield basis are possible, much more energy-intensive scenarios also occur. Certain strategies for lowering energy inputs (e.g., reduced illumination levels) can result in lower yields, and thus not necessarily reduce the ultimate energy-intensity per unit weight. Only those strategies that improve equipment and process energy efficiency, while not correspondingly attenuating yields would reduce energy intensity.

Due to the proprietary and often illicit nature of Cannabis cultivation, data are intrinsically uncertain. Key uncertainties are total production and the indoor fraction thereof, and the corresponding scaling up of relatively well-understood intensities of energy use per unit of production to state or national levels could result in 50% higher or lower aggregate results. Greenhouse-gas emissions estimates are in turn sensitive to the assumed mix of on- and off-grid power production technologies and fuels, as off-grid production (almost universally done with diesel generators) can – depending on the prevailing fuel mix in the grid – have substantially higher emissions per kilowatt-hour than grid power. Final energy costs are a direct function of the aforementioned factors, combined with electricity tariffs, which vary widely geographically and among customer classes. The assumptions about vehicle energy use are likely conservative, given the longer-range transportation associated with interstate distribution.

Some localities (very cold and very hot climates) will see much larger shares of production indoors, and have higher space-conditioning energy demands than the typical conditions assumed here. More in-depth analyses could explore the variations introduced by geography and climate, alternate technology configurations, and production techniques.

4. Energy implications

Accelerated electricity demand growth has been observed in areas reputed to have extensive indoor *Cannabis* cultivation. For example, following the legalization of cultivation for medical purposes (Phillips, 1998; Roth, 2005; Clapper et al., 2010) in California in 1996, Humboldt County experienced a 50% rise in per-capita residential electricity use compared to other parts of the state (Lehman and Johnstone, 2010).

Aside from sporadic news reports (Anderson, 2010; Quinones, 2010), policymakers and consumers possess little information on the energy implications of this practice. A few prior studies tangentially mentioning energy use associated with *Cannabis* production used cursory methods and under-estimate energy use significantly (Plecas et al., 2010 and Caulkins, 2010).

Driving the large energy requirements of indoor production facilities are lighting levels matching those found in hospital operating rooms (500-times greater than recommended for reading) and 30 hourly air changes (6-times the rate in high-tech laboratories, and 60-times the rate in a modern home). Resulting power densities are on the order of 2000 W/m^2, which is on a par with that of modern datacenters. Indoor carbon dioxide (CO_2) levels are often raised to 4-times natural levels in order to boost plant growth. However, by shortening the growth cycle, this practice may reduce final energy intensity.

Specific energy uses include high-intensity lighting, dehumidification to remove water vapor and avoid mold formation, space heating or cooling during non-illuminated periods and drying, pre-heating of irrigation water, generation of carbon dioxide by burning fossil fuel, and ventilation and air-conditioning to remove waste heat. Substantial energy inefficiencies arise from air cleaning, noise and odor suppression, and inefficient electric generators used to avoid conspicuous utility bills. So-called "grow houses" – residential buildings converted for *Cannabis* production – can contain 50,000 to 100,000 W of installed lighting power (Brady, 2004). Much larger facilities are also used.

Based on the model developed in this article, approximately 13,000 kW/h/year of electricity is required to operate a standard production module (a 1.2 × 1.2 × 2.4 m (4 × 4 × 8 ft) chamber). Each module yields approximately 0.5 kg (1 pound) of final product per cycle, with four or five production cycles conducted per year. A single grow house can contain 10 to 100 such modules.

To estimate national electricity use, these normalized values are applied to the lower end of the range of the aforementioned estimated production (10,000 t per year), with one-third of the activity takes place under indoor conditions. This indicates electricity use of about 20 TW/h/year nationally (including off-grid production). This is equivalent to that of 2 million average U.S. homes, corresponding to approximately 1% of national electricity consumption — or the output of 7 large electric power plants (Koomey et al., 2010). This energy, plus associated fuel uses (discussed below), is valued at $6 billion annually, with associated emissions of 15 million metric ton of CO_2 — equivalent to that of 3 million average American cars (Fig. 1 and Tables 1–3.)

Fuel is used for several purposes, in addition to electricity. The carbon dioxide injected into grow rooms to increase yields is produced industrially (Overcash et al., 2007) or by burning propane or natural gas within the grow room contributes about 1–2% to the carbon footprint and represents a yearly U.S. expenditure of $0.1 billion. Vehicle use associated with production and distribution contributes about 15% of total emissions, and represents a yearly expenditure of $1 billion. Off-grid diesel- and gasoline-fueled electric generators have per-kilowatt-hour emissions burdens that are 3- and 4-times those of average grid electricity in California. It requires 70 gallon of diesel fuel to produce one indoor *Cannabis* plant (or the equivalent yield per unit area), or 140 gallon with smaller, less-efficient gasoline generators.

In California, the top-producing state, indoor cultivation is responsible for about 3% of all electricity use, or 9% of household use.[2] This corresponds to the electricity use of 1 million average California homes, greenhouse-gas emissions equal to those from 1 million average cars, and energy expenditures of $3 billion per

[2] This is somewhat higher than estimates previously made for British Columbia, specifically, 2% of total Provincial electricity use or 6% of residential use (Garis, 2008; Bellett, 2010).

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

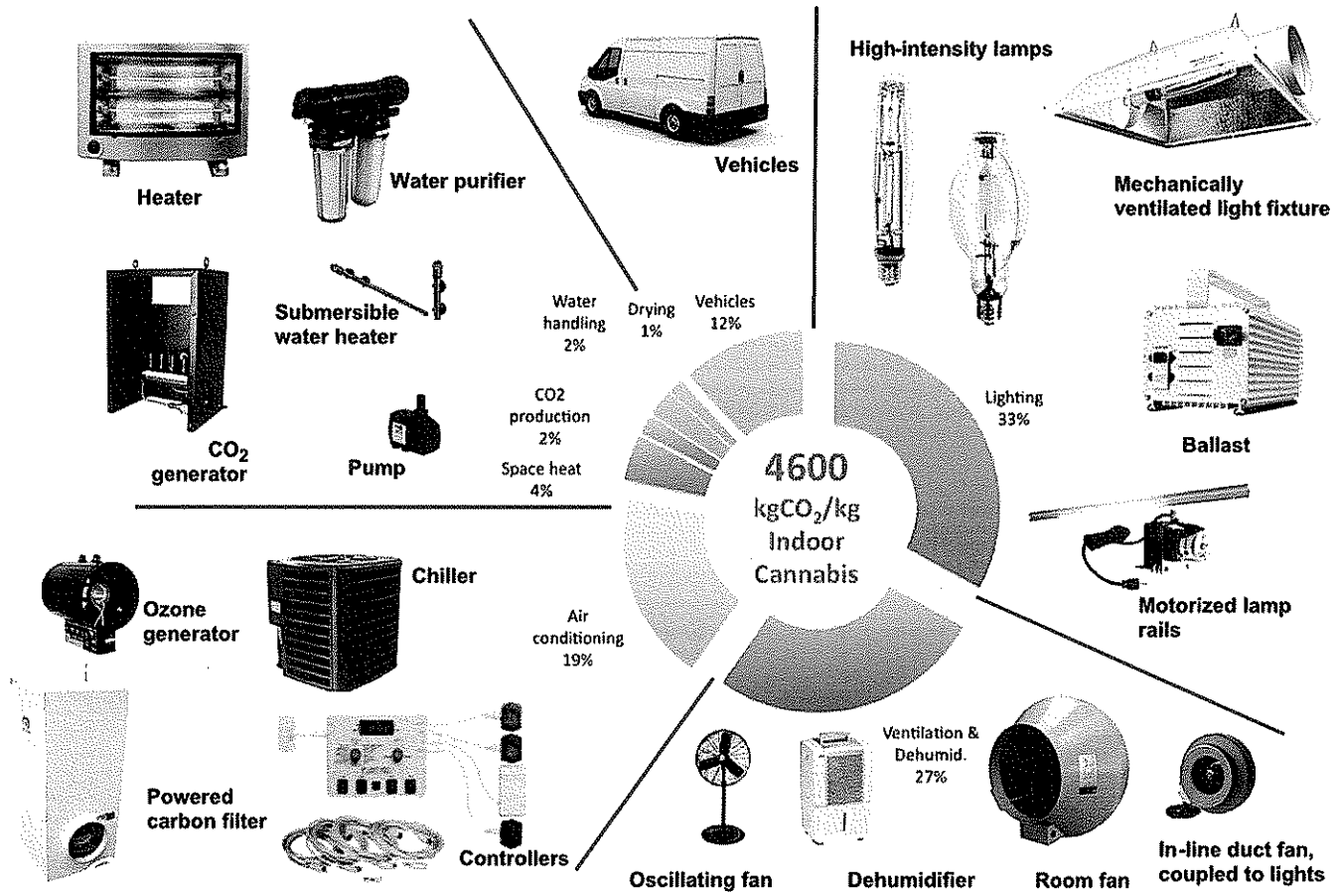


Fig. 1. Carbon footprint of indoor Cannabis production.

Table 1
Carbon footprint of indoor *Cannabis* production, by end use (average U.S conditions).

	Energy intensity (kW/h/kg yield)	Emissions factor ($kgCO_2$ emissions/kg yield)	
Lighting	2283	1520	33%
Ventilation & dehumid.	1848	1231	27%
Air conditioning	1284	855	19%
Space heat	304	202	4%
CO_2 injected to increase foliage	93	82	2%
Water handling	173	115	2%
Drying	90	60	1%
Vehicles		546	12%
Total	6074	4612	100%

Note: The calculations are based on U.S.-average carbon burdens of 0.666 kg/kW/h. "CO_2 injected to increase foliage" represents combustion fuel to make on-site CO_2. Assumes 15% of electricity is produced in off-grid generators.

year. Due to higher electricity prices and cleaner fuels used to make electricity, California incurs 50% of national energy costs but contributes only 25% of national CO_2 emissions from indoor *Cannabis* cultivation.

From the perspective of individual consumers, a single *Cannabis* cigarette represents 1.5 kg (3 pounds) of CO_2 emissions, an amount equal to driving a 44 mpg hybrid car 22 mile or running a 100-watt light bulb for 25 h, assuming average U.S. electricity emissions. The electricity requirement for one single production module equals that of an average U.S. home and twice that of an average California home. The added electricity use is equivalent to running about 30 refrigerators.

From the perspective of a producer, the national-average annual energy costs are approximately $5500 per module or $2500 per kilogram of finished product. This can represent half the wholesale value of the finished product (and a substantially lower portion at retail), depending on local conditions. For average U.S. conditions, producing one kilogram of processed *Cannabis* results in 4600 kg of CO_2 emissions to the atmosphere (and 50% more when off-grid diesel power generation is used), a very significant carbon footprint. The emissions associated with one kilogram of processed *Cannabis* are equivalent to those of driving across country 11 times in a 44-mpg car.

These results reflect typical production methods. Much more energy-intensive methods occur, e.g., rooms using 100% recirculated air with simultaneous heating and cooling, hydroponics, or energy end uses not counted here such as well-water pumps and water purification systems. Minimal information and consideration of energy use, coupled with adaptations for security and privacy (off-grid generation, no daylighting, odor and noise control) lead to particularly inefficient configurations and correspondingly elevated energy use and greenhouse-gas emissions.

The embodied energy of inputs such as soil, fertilizer, water, equipment, building materials, refinement, and retailing is not estimated here and should be considered in future assessments. The energy use for producing outdoor-grown *Cannabis* (approximately two-thirds of all production) is also not estimated here.

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

Table 2
Equivalencies.

Indoor Cannabis production consumes…	**3%**	of California's total electricity, and	**9%**	of California's household electricity	**1%**	of total U.S. electricity, and	2% of U.S. household electricity
U.S. Cannabis production & distribution energy costs…	**$ 6**	Billion, and results in the emissions of	**15**	Million tonnes per year of greenhouse gas emissions (CO_2)	Equal to the emissions of	**3**	million average cars
U.S. electricity use for Cannabis production is equivalent to that of…	**1.7**	Million average U.S. homes	**or**	**7**	Average U.S. power plants		
California Cannabis production and distribution energy costs…	**$ 3**	Billion, and results in the emissions of	**4**	Million tonnes per year of greenhouse gas emissions (CO_2)	Equal to the emissions of	**1**	Million average cars
California electricity use for Cannabis production is equivalent to that of…	**1**	Million average California homes					
A typical 4 × 4 × 8-ft production module, accomodating four plants at a time, consumes as much electricity as…	**1**	Average U.S. homes, or	**2**	Average California homes	or	**29**	Average new refrigerators
Every 1 kilogram of Cannabis produced using national-average grid power results in the emissions of…	**4.3**	Tonnes of CO_2	Equiva-	**7**	Cross-country trips in a 5.3 l/100 km (44 mp g) car		
Every 1 kg of Cannabis produced using a prorated mix of grid and off-grid generators results in the emissions of…	**4.6**	Tonnes of CO_2	Equiva-	**8**	Cross-country trips in a 5.3 l/100 km (44 mp g) car		
Every 1 kg of Cannabis produced using off-grid generators results in the emissions of…	**6.6**	Tonnes of CO_2	Equiva-	**11**	Cross-country trips in a 5.3 l/100 km (44 mp g) car		
Transportation (wholesale+retail) consumes…	**226**	Liters of gasoline per kg	or	**$ 1**	Billion dollars annually, and	**546**	Kilograms of CO_2 per kilogram of final product
One Cannabis cigarette is like driving…	**37**	km in a 5.3 l/100 km (44 mpg) car	Emitting	**2**	kg of CO_2, which is equivalent to operating a 100-watt light bulb for	**25**	Hours
Of the total wholesale price…	**49%**	is for energy (at average U.S. prices)					

If improved practices applicable to commercial agricultural greenhouses are any indication, such large amounts of energy are not required for indoor *Cannabis* production.[3] The application of cost-effective, commercially-available efficiency improvements to the prototypical facility modeled in this article could reduce energy intensities by at least 75% compared to the typical-efficiency baseline. Such savings would be valued at approximately $40,000/year for a generic 10-module operation (at California energy prices and $10,000/year at U.S. average prices) (Fig. 2(a)–(b). These estimated energy use reductions reflect practices that are commonplace in other contexts such as more efficient components and controls (lights, fans, space-conditioning), use of daylight, optimized air-handling systems, and relocation of heat-producing equipment out of the cultivation room. Moreover, strain choice alone results in a factor-of-two difference in yields per unit of energy input (Arnold, 2011).

[3] See, e.g., this University of Michigan resource: http://www.hrt.msu.edu/energy/Default.htm

5. Energy intensities in context

Policymakers and other interested parties will rightfully seek to put these energy indicators in context with other activities in the economy.

One can readily identify other energy end-use activities with far greater impacts than that of *Cannabis* production. For example, automobiles are responsible for about 33% of U.S. greenhouse-gas emissions (USDOE, 2009), which is100-times as much as those produced by indoor *Cannabis* production (0.3%). The approximately 20 TW/h/year estimated for indoor *Cannabis* production is about one/third that of U.S. data centers (US EPA, 2007a, 2007b), or one-seventh that of U.S. household refrigerators (USDOE, 2008). These shares would be much higher in states where *Cannabis* cultivation is concentrated (e.g., one half that of refrigerators in California (Brown and Koomey, 2002)).

On the other hand, this level of energy use is high in comparision to that used for other indoor cultivation practices, primarily owing to the lack of daylighting. For comparison, the energy intensity of Belgian greenhouses is estimated at approximately 1000 MJ/m^2 (De Cock and Van Lierde, No date), or about 1% that estimated here for indoor *Cannabis* production.

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

Table 3
Energy indicators (average U.S. conditions).

	per cycle, per production module	per year, per production module	
Energy use			
Connected load		3,225	(watts/module)
Power density		2,169	(watts/m^2)
Elect	2756	12,898	(kW/h/module)
Fuel to make CO_2	0.3	1.6	(GJ)
Transportation fuel	27	127	(Gallons
On-grid results			
Energy cost	846	3,961	$/module
Energy cost		1,866	$/kg
Fraction of wholesale price		47%	
CO_2 emissions	1936	9,058	kg
CO_2 emissions		4,267	kg/kg
Off-grid results (diesel)			
Energy cost	1183	5,536	$/module
Energy cost		2,608	$/kg
Fraction of wholesale price		65%	
CO_2 emissions	2982	13,953	kg
CO_2 emissions		6,574	$kgCO_2$/kg
Blended on/off grid results			
Energy cost	897	4,197	$/module
Energy cost		1,977	$/kg
Fraction of wholesale price		49%	
CO_2 emissions	2093	9,792	kg
CO_2 emissions		4,613	$kgCO_2$/kg
Of which, indoor CO_2 production	9	42	$kgCO_2$
Of which, vehicle use			
Fuel use			
During production		79	Liters/kg
Distribution		147	Liters/kg
Cost			
During production		77	$/kg
Distribution		143	$/kg
Emissions			
During production		191	$kgCO_2$/kg
Distribution		355	$kgCO_2$/kg

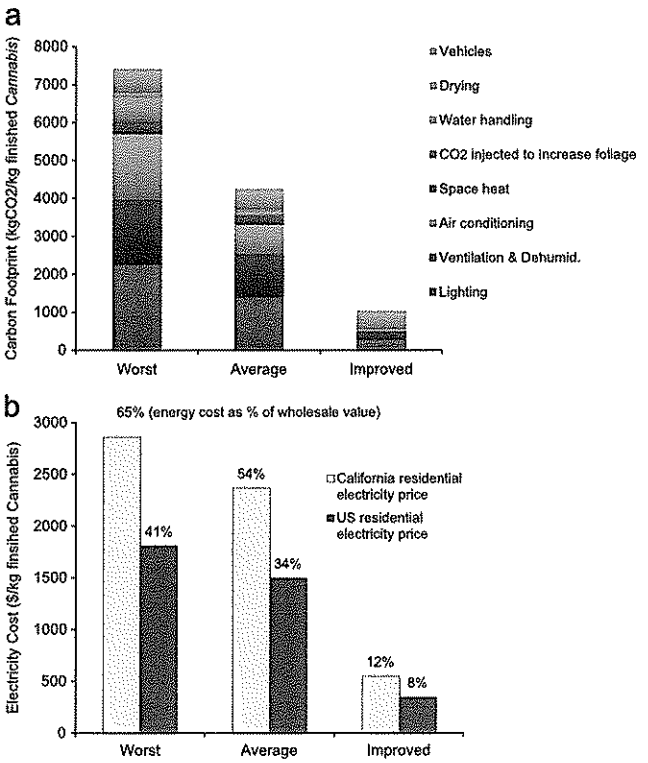


Fig. 2. Carbon footprint and energy cost for three levels of efficiency. (a) Indoor cannabis: carbon footprint. (b) Indoor cannabis: electricity cost. Assumes a wholesale price of $4400/kg. Wholesale prices are highly variable and poorly documented.

Energy intensities can also be compared to those of other sectors and activities.

- Pharmaceuticals — Energy represents 1% of the value of U.S. pharmaceutical shipments (Galitsky et al., 2008) versus 50% of the value of Cannabis wholesale prices. The U.S. "Pharma" sector uses $1 billion/year of energy; Indoor Cannabis uses $6 billion.
- Other industries — Defining "efficiency" as how much energy is required to generate economic value, Cannabis comes out the highest of all 21 industries (measured at the three-digit SIC level). At ~20 MJ per thousand dollars of shipment value (wholesale price), Cannabis is followed next by paper (~14), nonmetallic mineral products (~10), primary metals (~8), petroleum and coal products (~6), and then chemicals (~5) (Fig. 3). However, energy intensities are on a par with *Cannabis* in various subsectors (e.g., grain milling, wood products, rubber) and exceed those of *Cannabis* in others (e.g., pulp mills).
- Alcohol — The energy used to produce one marijuana cigarette would also produce 18 pints of beer (Galitsky et al., 2003).
- Other building types — Cannabis production requires 8-times as much energy per square foot as a typical U.S. commercial building (4x that of a hospital and 20x that of a building for religious worship), and 18-times that of an average U.S. home (Fig. 4).

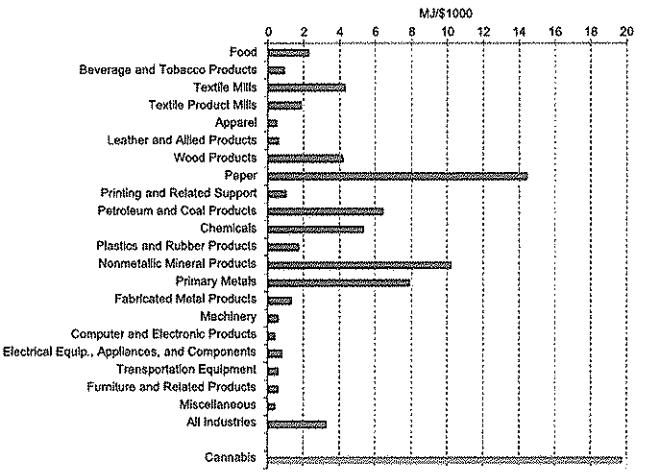


Fig. 3. Comparative energy intensities, by sector (2006).

6. Outdoor cultivation

Shifting cultivation outdoors can nearly eliminate energy use for the cultivation process. Many such operations, however, require water pumping as well as energy-assisted drying techniques. Moreover, vehicle transport during production and distribution remains part of the process, more so than for indoor operations.

A common perception is that the potency of *Cannabis* produced indoors exceeds that of that produced outdoors, leading

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

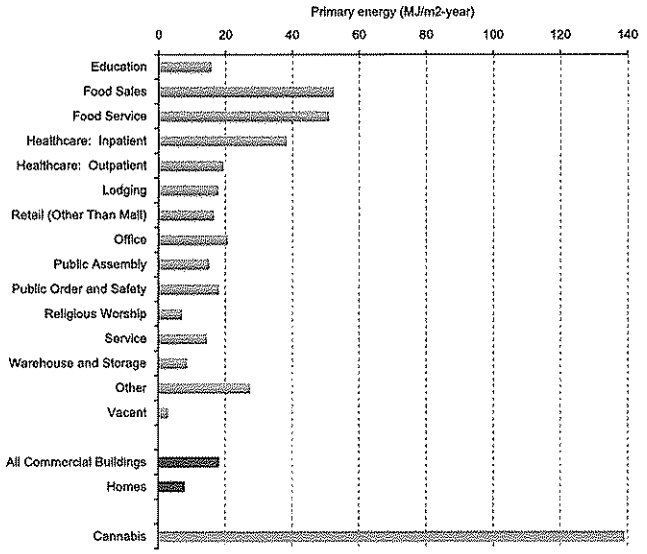


Fig. 4. Comparative energy intensities, by U.S. building type (2003).

consumers to demand *Cannabis* produced indoors. Federal sources (National Drug Intelligence Center, 2005) as well as independent testing laboratories (Kovner, 2011) actually find similar potencies when best practices are used.

Illegal clearing of land is common for multi-acre plantations, and, depending on the vegetation type, can accordingly mobilize greenhouse-gas emissions. Standing forests (a worst-case scenario) hold from 125 to 1500 t of CO_2 per hectare, depending on tree species, age, and location (National Council for Air and Soil Improvement, 2010). For biomass carbon inventories of 750 t/ha and typical yields (5000 kg/ha) (UNODC, 2009), associated biomass-related CO_2 emissions would be on the order of 150 kg CO_2/kg *Cannabis* (for only one harvest per location), or 3% of that associated with indoor production. These sites typically host on the order of 10,000 plants, although the number can go much higher (Mallery, 2011). When mismanaged, the practice of outdoor cultivation imposes multiple environmental impacts aside from energy use. These include deforestation; destruction of wetlands, runoff of soil, pesticides, insecticides, rodenticides, and human waste; abandoned solid waste; and unpermitted impounding and withdrawals of surface water (Mallery, 2011; Revelle, 2009). These practices can compromise water quality, fisheries, and other ecosystem services.

7. Policy considerations

Current indoor *Cannabis* production and distribution practices result in prodigious energy use, costs, and unchecked greenhouse-gas pollution. While various uncertainties exist in the analysis, the overarching qualitative conclusions are robust. More in-depth analysis and greater transparency of the energy impacts of this practice could improve decision-making by policymakers and consumers alike.

There is little, if any, indication that public policymakers have incorporated energy and environmental considerations into their deliberations on *Cannabis* production and use. There are additional adverse impacts of the practice that merit attention, including elevated moisture levels associated with indoor cultivation that can cause extensive damage to buildings,[4] as well as electrical fires caused by wiring out of compliance with safety codes (Garis, 2008). Power theft is common, transferring those energy costs to the general public (Plecas et al., 2010). As noted above, simply shifting production outdoors can invoke new environmental impacts if not done properly.

Energy analysts have also not previously addressed the issue. Aside from the attention that any energy use of this magnitude normally receives, the hidden growth of electricity demand in this sector confounds energy forecasts and obscures savings from energy efficiency programs and policies. For example, Auffhammer and Aroonruengsawat (2010) identified a

[4] For observations from the building inspectors community, see http://www.nachi.org/marijuana-grow-operations.htm

Table A1
Configuration, environmental conditions, set-points.

Production parameters		
Growing module	1.5	m^2 (excl. walking area)
Number of modules in a room	10	
Area of room	22	m^2
Cycle duration	78	days
Production continuous throughout the year	4.7	cycles
Illumination	Leaf phase	Flowering phase
Illuminance	25 klux	100 klux
Lamp type	Metal halide	High-pressure sodium
Watts/lamp	600	1000
Ballast losses (mix of magnetic & digital)	13%	0.13
Lamps per growing module	1	1
Hours/day	18	12
Days/cycle	18	60
Daylighting	None	none
Ventilation		
Ducted luminaires with "sealed" lighting compartment	150	CFM/1000 W of light (free flow)
Room ventilation (supply and exhaust fans)	30	ACH
Filtration	Charcoal filters on exhaust; HEPA on supply	
Oscilating fans: per module, while lights on	1	
Water		
Application	151	liters/room-day
Heating	Electric submersible heaters	
Space conditioning		
Indoor setpoint — day	28	C
Indoor setpoint — night	20	C
AC efficiency	10	SEER
Dehumidification	7x24	hours
CO_2 production — target concentration (mostly natural gas combustion in space)	1500	ppm
Electric space heating	When lights off to maintain indoor setpoint	
Target indoor humidity conditions	40–50%	
Fraction of lighting system heat production removed by luminaire ventilation	30%	
Ballast location	Inside conditioned space	
Drying		
Space conditioning, oscillating fans, maintaining 50% RH, 70–80F	7	Days
Electricity supply		
grid	85%	
grid-independent generation (mix of diesel, propane, and gasoline)	15%	

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

Table A2
Assumptions and conversion factors.

Service levels		
Illuminance*	25–100	1000 lux
Airchange rates*	30	Changes per hour
Operations		
Cycle duration**	78	Days
Cycles/year**	4.7	Continuous production
Airflow**	96	Cubic feet per minute, per module
Lighting		
Leafing phase		
Lighting on-time*	18	hrs/day
Duration*	18	days/cycle
Flowering phase		
Lighting on-time*	12	hrs/day
Duration*	60	days/cycle
Drying		
Hours/day*	24	hrs
Duration*	7	days/cycle
Equipment		
Average air-conditioning age	5	Years
Air conditioner efficiency [Standards increased to SEER 13 on 1/23/2006]	10	SEER
Fraction of lighting system heat production removed by luminaire ventilation	0.3	
Diesel generator efficiency*	27%	55 kW
Propane generator efficiency*	25%	27 kW
Gasoline generator efficiency*	15%	5.5 kW
Fraction of total prod'n with generators*	15%	
Transportation: Production phase (10 modules)	25	Miles roundtrip
Daily service (1 vehicle)	78	Trips/cycle. Assume 20% live on site
Biweekly service (2 vehicles)	11.1	Trips/cycle
Harvest (2 vehicles)	10	Trips/cycle
Total vehicle miles**	2089	Vehicle miles/cycle
Transportation: Distribution		
Amount transported wholesale	5	kg per trip
Mileage (roundtrip)	1208	km/cycle
Retail (0.25oz × 5 miles roundtrip)	5668	Vehicle-km/cycle
Total**	6876	Vehicle-km/cycle
Fuel economy, typical car [a]	10.7	l/100 km
Annual emissions, typical car [a]	5195	$kgCO_2$
	0	$kgCO_2$/mile
Annual emissions, 44-mpg car**	2,598	$kgCO_2$
	0.208	$kgCO_2$/mile
Cross-country U.S. mileage	4493	km
Fuels		
Propane [b]	25	MJ/liter
Diesel [b]	38	MJ/liter
Gasoline [b]	34	MJ/liter
Electric generation mix*		
Grid	85%	share
Diesel generators	8%	share
Propane generators	5%	share
Gasoline generators	2%	share
Emissions factors		
Grid electricity — U.S. [c]	0.609	$kgCO_2$/kW/h
Grid electricity — CA [c]	0.384	$kgCO_2$/kW/h
Grid electricity — non-CA U.S. [c]	0.648	$kgCO_2$/kW/h
Diesel generator**	0.922	$kgCO_2$/kW/h
Propane generator**	0.877	$kgCO_2$/kW/h
Gasoline generator**	1.533	$kgCO_2$/kW/h
Blended generator mix**	0.989	$kgCO_2$/kW/h
Blended on/off-grid generation — CA**	0.475	$kgCO_2$/kW/h
Blended on/off-grid generation — U.S.**	0.666	$kgCO_2$/kW/h
Propane combustion	63.1	$kgCO_2$/MBTU
Prices		
Electricity price — grid (California — PG&E) [d]	0.390	per kW/h (Tier 5)
Electricity price — grid (U.S.) [e]	0.247	per kW/h
Electricity price — off-grid**	0.390	per kW/h
Electricity price — blended on/off — CA**	0.390	per kW/h
Electricity price — blended on/off — U.S.**	0.268	per kW/h
Propane price [f]	0.58	$/liter
Gasoline price — U.S. average [f]	0.97	$/liter
Diesel price — U.S. average [f]	1.05	$/liter
Wholesale price of Cannabis [g]	4,000	$/kg
Production		
Plants per production module*	4	
Net production per production module [h]	0.5	kg/cycle
U.S. production (2011) [i]	10,000	metric tonnes/y
California production (2011) [i]	3,902	metric tonnes/y
Fraction produced indoors [i]	33%	
U.S. indoor production modules**	1,570,399	
Calif indoor production modules**	612,741	
Cigarettes per kg**	3,000	
Other		
Average new U.S. refrigerator	450	kW/h/year
	173	$kgCO_2$/year (U.S. average)
Electricity use of a typical U.S. home — 2009 [j]	11,646	kW/h/year
Electricity use of a typical California home — 2009 [k]	6,961	kW/h/year

Notes:
* Trade and product literature; interviews with equipment vendors.
** Calculated from other values.
Notes for Table A2.
[a]. U.S. Environmental Protection Agency., 2011.
[b]. *Energy conversion factors*, U.S. Department of Energy, http://www.eia.doe.gov/energyexplained/index.cfm?page=about_energy_units, [Accessed February 5, 2011].
[c]. United States: (USDOE 2011); California (Marnay et al., 2002).
[d]. Average prices paid in California and other states with inverted-block tariffs are very high because virtually all consumption is in the most expensive tiers. Here the PG&E residential tariff as of 1/1/11, Tier 5 is used as a proxy for California http://www.pge.com/tariffs/ResElecCurrent.xls, (Accessed February 5, 2011). In practice a wide mix of tariffs apply, and in some states no tier structure is in place, or the proportionality of price to volume is nominal.
[e]. State-level residential prices, weighted by *Cannabis* production (from Gettman, 2006) with actual tariffs and U.S. Energy Information Administration, "Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State", http://www.eia.doe.gov/electricity/epm/table5_6_a.html, (Accessed February 7, 2011)
[f]. U.S. Energy Information Administration, Gasoline and Diesel Fuel Update (as of 2/14/2011) – see http://www.eia.gov/oog/info/gdu/gasdiesel.asp Propane prices – http://www.eia.gov/dnav/pet/pet_pri_prop_a_EPLLPA_PTA_dpgal_m.htm, (Accessed April 3, 2011).
[g]. Montgomery, 2010.
[h]. Toonen et al., 2006); Plecas et al., 2010.
[i]. *Total Production*: The lower value of 10,000 t per year is conservatively retained. Were this base adjusted to 2011 values using 10.9%/year net increase in number of consumers between 2007 and 2009 per U.S. Department of Health and Human Services (2010), the result would be approximately 17 million tonnes of total production annually (indoor and outdoor). *Indoor Share of Total Production*: The three-fold changes in potency over the past two decades, reported by federal sources, are attributed at least in part to the shift towards indoor cultivation See http://www.justice.gov/ndic/pubs37/37035/national.htm and (Hudson, 2003). A weighted-average potency of 10% THC (U.S. Office of Drug Control Policy, 2010) reconciled with assumed 7.5% potency for outdoor production and 15% for indoor production implies 33.3%::67.7% indoor::outdoor production shares. For reference, as of 2008, 6% of eradicated plants were from indoor operations, which are more difficult to detect than outdoor operations. A 33% indoor share, combined with per-plant yields from Table 2, would correspond to a 4% eradication success rate for the levels reported (415,000 indoor plants eradicated in 2009) by the U.S. Drug Enforcement Agency (http://www.justice.gov/dea/programs/marijuana.htm). Assuming 400,000 members of medical Cannabis dispensaries in California (each of which is permitted to cultivate), and 50% of these producing in the generic 10-module room assumed in this analysis, output would slightly exceed this study's estimate of total statewide production. In practice, the vast majority of indoor production is no doubt conducted outside of the medical marijuana system.
[j]. Total U.S. electricity sales: U.S. energy information administration, "retail sales of electricity to ultimate customers: Total by end-use sector" http://www.eia.gov/cneaf/electricity/epm/table5_1.html, (Accessed March 5, 2011)
[k]. California Energy Commission, 2009; 2011.

statistically significant, but unexplained, increase in the growth rate for residential electricity in California during the years when indoor *Cannabis* production grew as an industry (since the mid-1990s).

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

Table A3
Energy model.

ELECTRICITY	Energy type	Penetration	Rating (Watts or %)	Number of 4 × 4 × 8-ft production modules served	Input energy per module	Units	Hours/day (leaf phase)	Hours/day (flower phase)	Days/cycle (leaf phase)	Days/cycle (flower phase)	kW/h/cycle	kW/h/year per production module
Light												
Lamps (HPS)	elect	100%	1,000	1	1,000	W		12		60	720	3,369
Ballasts (losses)	elect	100%	13%	1	130	W		12		60	94	438
Lamps (MH)	elect	100%	600	1	600	W	18		18		194	910
Ballast (losses)	elect	100%	0	1	78	W	18		18		25	118
Motorized rail motion	elect	5%	6	1	0.3	W	18	12	18	60	0	1
Controllers	elect	50%	10	10	1	W	24	24	18	60	2	9
Ventilation and moisture control												
Luminare fans (sealed from conditioned space)	elect	100%	454	10	45	W	18	12	18	60	47	222
Main room fans — supply	elect	100%	242	8	30	W	18	12	18	60	31	145
Main room fans — exhaust	elect	100%	242	8	30	W	18	12	18	60	31	145
Circulating fans (18")	elect	100%	130	1	130	W	24	24	18	60	242	1,134
Dehumidification	elect	100%	1,035	4	259	W	24	24	18	60	484	2,267
Controllers	elect	50%	10	10	1	W	24	24	18	60	2	9
Spaceheat or cooling												
Resistance heat or AC [when lights off]		90%	1,850	10	167	W	6	12	18	60	138	645
Carbon dioxide injected to increase foliage												
Parasitic electricity	elect	50%	100	10	5	W	18	12	18	60	5	24
AC (see below)	elect	100%										
In-line heater	elect	5%	115	10	0.6	W	18	12	18	60	1	3
Dehumidification (10% adder)	elect	100%	104	0	26	W	18	12	18	60	27	126
Monitor/control	elect	100%	50	10	5	W	24	24	18	60	9	44
Other												
Irrigation water temperature control	elect	50%	300	10	15	W	18	12	18	60	19	89
Recirculating carbon filter [sealed room]	elect	20%	1,438	10	29	W	24	24	18	60	54	252
UV sterilization	Elect	90%	23	10	2.1	W	24	24	18	60	4	18
Irrigation pumping	elect	100%	100	10	10	W	2	2	18	60	2	7
Fumigation	elect	25%	20	10	1	W	24	24	18	60	1	4
Drying												
Dehumidification	elect	75%	1,035	10	78	W		24		7	13	61
Circulating fans	elect	100%	130	5	26	W		24		7	4	20
Heating	elect	75%	1,850	10	139	W		24		7	23	109
Electricity subtotal	elect										2,174	10,171
Air-conditioning				10	420	W					583	2,726
Lighting loads				10		W					259	1,212
Loads that can be remoted	elect	100%	1,277	10		W					239	1,119
Loads that can't be remoted	elect	100%	452	10		W					85	396
CO2-production heat removal	elect	45%	1,118	17		W	18	12	18	60	—	—
Electricity Total	elect				3,225	W					2,756	12,898

FUEL	Units	Technology Mix	Rating (BTU/h)	Number of 4 × 4 × 8-ft production modules served	Input energy per module		Hours/day (leaf phase)	Hours/day (flower phase)	Days/cycle (leaf phase)	Days/cycle (flower phase)	GJ or $kgCO_2$/cycle	GJ or $kgCO_2$/year
On-site CO_2 production												
Energy use	propane	45%	11,176	17	707	kJ/h	18	12	18	60	0.3	1.5
CO2 production -> emissions	kg/CO_2										20	93
Externally produced Industrial CO_2		5%		1	0.003	liters CO_2/hr	18	12	18	60	0.6	2.7
Weighted-average on-site/purchased	$kgCO_2$										2	10

For *Cannabis* producers, energy-related production costs have historically been acceptable given low energy prices and high product value. As energy prices have risen and wholesale commodity prices fallen, high energy costs (now 50% on average of wholesale value) are becoming untenable. Were product prices to fall as a result of legalization, indoor production could rapidly become unviable.

For legally sanctioned operations, the application of energy performance standards, efficiency incentives and education, coupled with the enforcement of appropriate construction codes could lay a foundation for public-private partnerships to reduce undesirable impacts of indoor *Cannabis* cultivation.[5] There are early indications of efforts to address this.[6] Were such operations to receive some form of independent certification and product labeling, environmental impacts could be made visible to otherwise unaware consumers.

Acknowledgment

Two anonymous reviewers provided useful comments that improved the paper. Scott Zeramby offered particularly valuable insights into technology characteristics, equipment configurations, and market factors that influence energy utilization in this context and reviewed earlier drafts of the report.

Appendix A

See Tables A1–A3.

References

Auffhammer, M., Aroonruengsawat A., 2010. Uncertainty over Population, Prices, or Climate? Identifying the Drivers of California's Future Residential Electricity Demand. Energy Institute at Haas (UC Berkeley) Working Paper, August.

Anderson, G., 2010. Grow Houses Gobble Energy. Press Democrat, July 25.See ⟨http://www.pressdemocrat.com/article/20100725/ARTICLES/100729664⟩.

Arnold, J., 2011. Investigation of Relationship between Cannabis Plant Strain and Mass Yield of Flower Buds. Humboldt State University Proposal.

Barnes, B., 2010. Boulder Requires Medical Pot Growers to Go Green. NewsFirst5.com, Colorado Springs and Pueblo. May 19 ⟨www.newsfirst5.com/…/boulder-requires-medical-pot-growers-to-go-green1/⟩ , (accessed June 4, 2011).

Bellett, G., 2010. Pot growers stealing $100 million in electricity: B.C. Hydro studies found 500 Gigawatt hours stolen each year. Alberni Valley Times. October 8.

Brady, P., 2004. BC's million dollar grow shows. Cannabis Culture. ⟨http://www.cannabisculture.com/articles/3268.html⟩, (accessed June 4, 2011).

Brown, R.E., Koomey, J.G., 2002. Electricity use in California: past trends and present usage patterns. Lawrence Berkeley National Laboratory Report No 47992. ⟨http://enduse.lbl.gov/info/LBNL-47992.pdf⟩.

California Energy Commission, 2009. California energy demand: 2010–2020 — adopted forecast. Report CEC-200-2009-012-CMF), December 2009 (includes self-generation).

California Energy Commission, 2011. Energy almanac. ⟨http://energyalmanac.ca.gov/electricity/us_per_capita_electricity.html⟩, (accessed February 19, 2011).

Caulkins, P., 2010. Estimated cost of production for Legalized Cannabis. RAND Working Paper, WR-764-RC, July. Although the study over-estimates the hours of lighting required, it under-estimates the electrical demand and applies energy prices that fall far short of the inclining marginal-cost tariff structures applicable in many states, particularly California.

Central Valley High Intensity Drug Trafficking Area (HIDTA), 2010. Marijuana Production in California. 8 pp.

Clapper, J.R., et al., 2010. Anandamide suppresses pain initiation through a peripheral endocannabinoid mechanism, Nature Neuroscience, 13, 1265–1270, doi:10.1038/nn.2632 ⟨http://www.nature.com/neuro/journal/v13/n10/full/nn.2632.html⟩.

De Cock, L., Van Lierde, D. No Date. Monitoring Energy Consumption in Belgian Glasshouse Horticulture. Ministry of Small Enterprises, Trades and Agriculture. Center of Agricultural Economics, Brussels.

Easton, S.T., 2004. Marijuana Growth in British Columbia. Simon Frasier University, 78 pp.

Galitsky, C.S.-C. Chang, E. Worrell, Masanet, E., 2008. Energy efficiency improvement and cost saving opportunities for the pharmaceutical industry: an ENERGY STAR guide for energy and plant managers, Lawrence Berkeley National Laboratory Report 62806, ⟨http://ies.lbl.gov/iespubs/62806.pdf⟩.

Galitsky, C.N. Martin, E. Worrell, Lehman, B., 2003. Energy efficiency improvement and cost saving opportunities for breweries: an ENERGY STAR guide for energy and plant managers, Lawrence Berkeley National Laboratory Report No. 50934. ⟨www.energystar.gov/ia/business/industry/LBNL-50934.pdf⟩.

Garis, L., 2008. Eliminating Residential Hazards Associated with Marijuana Grow Operations and The Regulation of Hydroponics Equipment, British Columbia's Public Safety Electrical Fire and Safety Initiative, Fire Chiefs Association of British Columbia, 108pp.

Gettman, J., 2006. Marijuana Production in the United States, 29pp. ⟨http://www.drugscience.org/Archive/bcr2/app2.html⟩.

Harvey, M., 2009. California dreaming of full marijuana legalisation. The Sunday Times, (September). ⟨http://business.timesonline.co.uk/tol/business/industry_sectors/health/article6851523.ece⟩.

Hudson, R., 2003. Marijuana Availability in The United States and its Associated Territories. Federal Research Division, Library of Congress. Washington, D.C. (December). 129pp.

Koomey, J., et al. 2010. Defining a standard metric for electricity savings. Environmental Research Letters, 5, http://dx.doi.org/10.1088/1748-9326/5/1/014017.

Kovner, G., 2011. North coast: pot growing power grab. Press Democrat. ⟨http://www.pressdemocrat.com/article/20110428/ARTICLES/110429371?Title=Report-Growing-pot-indoors-leaves-big-carbon-footprint&tc=ar⟩.

Lehman, P., Johnstone, P., 2010. The climate-killers inside. North Coast Journal, March 11.

Mallery, M., 2011. Marijuana national forest: encroachment on California public lands for Cannabis cultivation. Berkeley Undergraduate Journal 23 (2), 1–49 ⟨http://escholarship.org/uc/our_buj?volume=23;issue=2⟩.

Marnay, C., Fisher, D., Murtishaw, S., Phadke, A., Price, L., Sathaye, J., 2002. Estimating carbon dioxide emissions factors for the California electric power sector. Lawrence Berkeley National Laboratory Report No. 49945. ⟨http://industrial-energy.lbl.gov/node/148⟩ (accessed February 5, 2011).

Mills, E., 2011. Energy up in smoke: the carbon footprint of indoor Cannabis production. Energy Associates Report. April 5, 14 pp.

Montgomery, M., 2010. Plummeting marijuana prices create a panic in Calif. ⟨ http://www.npr.org/templates/story/story.php?storyId=126806429⟩.

National Drug Intelligence Center, 2005. Illegal and Unauthorized Activities on Public Lands.

Overcash, Y., Li, E.Griffing, Rice, G., 2007. A life cycle inventory of carbon dioxide as a solvent and additive for industry and in products. Journal of Chemical Technology and Biotechnology 82, 1023–1038.

Peplow, M., 2005. Marijuana: the dope. Nature doi:10.1038/news050606-6, ⟨http://www.nature.com/news/2005/050607/full/news050606-6.html⟩.

Phillips, H., 1998. Of pain and pot plants. Nature. http://dx.doi.org/10.1038/news981001-2.

Plecas, D.J., Diplock, L., Garis, B., Carlisle, P., Neal, Landry, S., 2010. Journal of Criminal Justice Research 1 (2), 1–12.

Quinones, S., 2010. Indoor pot makes cash, but isn't green. SFGate, ⟨http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/10/21/BAPO1FU9MS.DTL⟩.

Revelle, T., 2009. Environmental impacts of pot growth. 2009. Ukiah Daily Journal. (posted at ⟨http://www.cannabisnews.org/united-states-cannabis-news/environmental-impacts-of-pot-growth/⟩).

Roth, M.D., 2005. Pharmacology: marijuana and your heart. Nature http://dx.doi.org/10.1038/434708a ⟨http://www.nature.com/nature/journal/v434/n7034/full/434708a.html⟩.

See Change Strategy, 2011. The State of the Medical Marijuana Markets 2011. http://medicalmarijuanamarkets.com/⟩.

National Council for Air and Soil Improvement, 2010. GCOLE: Carbon On Line Estimator. ⟨http://www.ncasi2.org/GCOLE/gcole.shtml⟩, (accessed Sepember 9, 2010).

Toonen, M., Ribot, S., Thissen, J., 2006. Yield of illicit indoor Cannabis cultivation in the Netherlands. Journal of Forensic Science 15 (5), 1050–1054 ⟨http://www.ncbi.nlm.nih.gov/pubmed/17018080⟩.

U.S. Department of Energy, Buildings Energy Data Book, 2008. Residential Energy End-Use Splits, by Fuel Type, Table 2.1.5 ⟨http://buildingsdatabook.eren.doe.gov/docs/xls_pdf/2.1.5.xlsx⟩.

U.S. Department of Energy, 2009. "Report DOE/EIA-0573(2009), Table 3.

U.S. Department of Energy, 2011. Voluntary Reporting of Greenhouse Gases Program ⟨http://www.eia.doe.gov/oiaf/1605/ee-factors.html⟩, (accessed February 7, 2011).

U.S. Department of Health and Human Services, 2010. 2009 National Survey on Drug Use and Health. ⟨http://oas.samhsa.gov/nsduhLatest.htm⟩.

U.S. Department of Justice, 2011a. Domestic Cannabis Eradication and Suppression Program. ⟨http://www.justice.gov/dea/programs/marijuana.htm⟩, (accessed June 5, 2011).

U.S. Department of Justice, 2011b. National Drug Threat Assessment: 2010 ⟨http://www.justice.gov/ndic/pubs38/38661/marijuana.htm#Marijuana⟩. (accessed June 5, 2011).

[5] The City of Fort Bragg, CA, has implemented elements of this in *TITLE 9 – Public Peace, Safety, & Morals*, Chapter 9.34. http://city.fortbragg.com/pages/searchResults.lasso?-token.editChoice=9.0.0&SearchType=MCsuperSearch&CurrentAction=viewResult#9.32.0

[6] For example, the City of Boulder, Colorado, requires medical *Cannabis* producers to offset their greenhouse-gas emissions (Barnes, 2010).

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

US EPA, 2007a. Report to Congress on Server and Data Center Energy Efficiency: Public Law 109-431. Washington, DC: U.S. Environmental Protection Agency, ENERGY STAR Program. August 2.

U.S. Environmental Protection Agency, 2007b. Report to Congress on Server and Data Center Energy Efficiency Public Law 109-431 133 pp.

U.S. Environmental Protection Agency, 2011. Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks. ⟨http://www.epa.gov/oms/consumer/f00013.htm⟩. (accessed February 5, 2011).

U.S. Office of National Drug Control Policy, 2011. Marijuana Facts and Figures. ⟨http://www.whitehousedrugpolicy.gov/drugfact/marijuana/marijuana_ff.html#extentofuse⟩, (accessed June 5, 2011).

UNODC, 2009. World Drug Report: 2009. United Nations Office on Drugs and Crime, p. 97. ⟨http://www.unodc.org/unodc/en/data-and-analysis/WDR-2009.html⟩ For U.S. conditions, indoor yields per unit area are estimated as up to 15-times greater than outdoor yields.

Please cite this article as: Mills, E., The carbon footprint of indoor *Cannabis* production. Energy Policy (2012), http://dx.doi.org/10.1016/j.enpol.2012.03.023

ENERGY UP IN SMOKE

THE CARBON FOOTPRINT OF INDOOR CANNABIS PRODUCTION

Evan Mills, Ph.D.*

April 5, 2011

---

* The research described in this report was conducted and published independently by the author, a long-time energy analyst and Staff Scientist at the Lawrence Berkeley National Laboratory, University of California. Scott Zeramby provided valuable insights into technology characteristics, equipment configurations, and market factors that influence energy utilization.

The report can be downloaded from: http://evan-mills.com/energy-associates/Indoor.html

On occasion, previously unrecognized spheres of energy use come to light. Important examples include the pervasive air leakage from ductwork in homes, the bourgeoning energy intensity of computer datacenters, and the electricity "leaking" from millions of small power supplies and other equipment. Intensive periods of investigation, technology R&D, and policy development gradually ensue in the wake of these discoveries.

The emergent industry of indoor Cannabis production appears to have joined the list. This report presents a model of the modern-day production process—based on public sources and equipment vendor data—and provides national scoping estimates of the energy use, costs, and greenhouse-gas emissions associated with this activity in the United States.[1]

Large-scale industrialized and highly energy-intensive indoor cultivation of Cannabis is a relatively new phenomenon, driven by criminalization, pursuit of security, and the desire for greater process control and yields.[2,3] The practice occurs in every state,[4] and the 415,000 indoor plants eradicated in 2009[5] represent only the tip of the iceberg.

Aside from sporadic news reports,[6,7] policymakers and consumers possess little information on the energy implications of this practice.[8] Substantially higher electricity demand growth is observed in areas reputed to have extensive indoor Cannabis cultivation. For example, following the legalization of cultivation for medical purposes in California in 1996, Humboldt County experienced a 50% rise in per-capita residential electricity use compared to other areas.[9] Cultivation is today legal in 17 states, albeit not federally sanctioned. In California, 400,000 individuals are authorized to grow Cannabis for personal medical use, or sale to 2,100 dispensaries.[10] Official estimates of total U.S. production varied from 10,000 to 24,000 metric tons per year in 2001,[4] making it the nation's largest crop by value.[11] As of 2006, one third of national indoor production was estimated to occur in California.[12] Based on a rising number of consumers (6.6% of U.S. population above the age of 12),[13] national production in 2011 is estimated for the purposes of this study at 17,000 metric tons, one-third occurring indoors.[14]

Driving the large energy requirements of indoor production facilities are lighting levels matching those found in hospital operating rooms (500-times greater than recommended for reading) and 30 hourly air changes (6-times the rate in high-tech laboratories, and 60-times the rate in a modern home). Resulting electricity intensities are 200 watts per square foot, which is on a par with modern datacenters. Indoor carbon dioxide (CO_2) levels are often raised to four-times natural levels in order to boost plant growth.

Specific energy uses include high-intensity lighting, dehumidification to remove water vapor, space heating during non-illuminated periods and drying, irrigation water pre-heating, generation of CO_2 by burning fossil fuel, and ventilation and air-conditioning to remove waste heat. Substantial energy inefficiencies arise from air cleaning, noise and odor suppression, and inefficient electric generators used to avoid conspicuous utility bills.

Based on these operational factors, the energy requirements to operate a standard production module—a 4x4x8 foot chamber—are approximately 13,000 kWh/year of electricity and 1.5×10^6 BTU/year of fossil fuel. A single grow house can contain 10 or more such modules. Power use scales to about 20 TWh/year nationally (including off-grid production and power theft), equivalent to that of 2 million average U.S. homes. This corresponds to 1% of national electricity consumption or 2% of that in households—or the output of 7 large electric power plants.[15] This energy, plus transportation fuel, is valued at $5 billion annually, with associated emissions of 17 million metric tons of CO_2—equivalent to that of 3 million average American cars. (See Figure 1 and Tables 1-5.)

Fuel is used for several purposes, in addition to electricity. Carbon dioxide, generated industrially[16] or by burning propane or natural gas, contributes about 2% to the carbon footprint. Vehicle use for production and distribution contributes about 15% of total emissions, and represents a yearly expenditure of $1 billion. Off-grid diesel- and gasoline-fueled electric generators have emissions burdens that are three- and four-times those of average grid electricity in California. It requires 70 gallons of diesel fuel to produce one indoor Cannabis plant, or 140 gallons with smaller, less-efficient gasoline generators.

In California, the top-producing state, indoor cultivation is responsible for about 3% of all electricity use or 8% of household use, somewhat higher than estimates previously made for British Columbia.[17] This corresponds to the electricity use of 1 million average California homes, greenhouse-gas emissions equal to those from 1 million average cars, and energy expenditures of $3 billion per year. Due to higher electricity prices and cleaner fuels used to make electricity, California incurs 70% of national energy costs but contributes only 20% of national CO_2 emissions from indoor Cannabis cultivation.

From the perspective of individual consumers, a single Cannabis cigarette represents 2 pounds of CO_2 emissions, an amount equal to running a 100-watt light bulb for 17 hours assuming average U.S. electricity emissions (or 30 hours on California's cleaner grid). The emissions associated with one kilogram of processed Cannabis are equivalent to those of driving across country 5 times in a 44-mpg car. One single production module doubles the electricity use of an average U.S. home and triples that of an average California home. The added electricity use is equivalent to running about 30 refrigerators. Producing one kilogram of processed Cannabis results in 3,000 kilograms of CO_2 emissions.

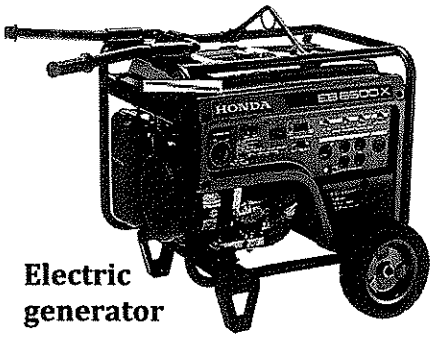
The energy embodied in the production of inputs such as fertilizer, water, equipment, and building materials is not estimated here and should be considered in future assessments.

Minimal information and consideration of energy use, coupled with adaptations for security and privacy, lead to particularly inefficient configurations and correspondingly elevated energy use and greenhouse-gas emissions. If improved practices applicable to commercial agricultural greenhouses are any indication, such large amounts of energy are not required for indoor Cannabis production.[18] Cost-effective efficiency improvements of 75% are conceivable, which would yield energy savings of about $25,000/year for a generic 10-module operation. Shifting cultivation outdoors virtually eliminates energy use (aside from transport), although, when mismanaged, the practice imposes other environmental impacts.[19] Elevated moisture levels associated with indoor cultivation can cause extensive damage to buildings.[20] Electrical fires are an issue as well.[21] For legally sanctioned operations, the application of energy performance standards, efficiency incentives and education, coupled with the enforcement of appropriate construction codes could lay a foundation for public-private partnerships to reduce undesirable impacts.[22] Were compliant operations to receive some form of independent certification and product labeling, environmental impacts could be made visible to otherwise unaware consumers.

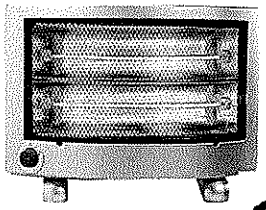
* * *

Current indoor Cannabis production and distribution practices result in prodigious energy use, costs, and greenhouse-gas pollution. The hidden growth of electricity demand in this sector confounds energy forecasts and obscures savings from energy efficiency programs and policies. More in-depth analysis and greater transparency in the energy impacts of this practice could improve decision-making by policymakers and consumers alike.

Figure 1. Carbon Footprint of Indoor Cannabis Production

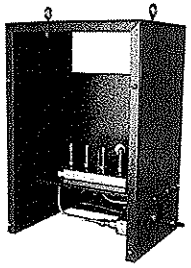


Electric generator



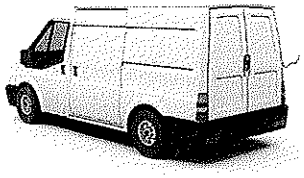
Heater

CO2 generator



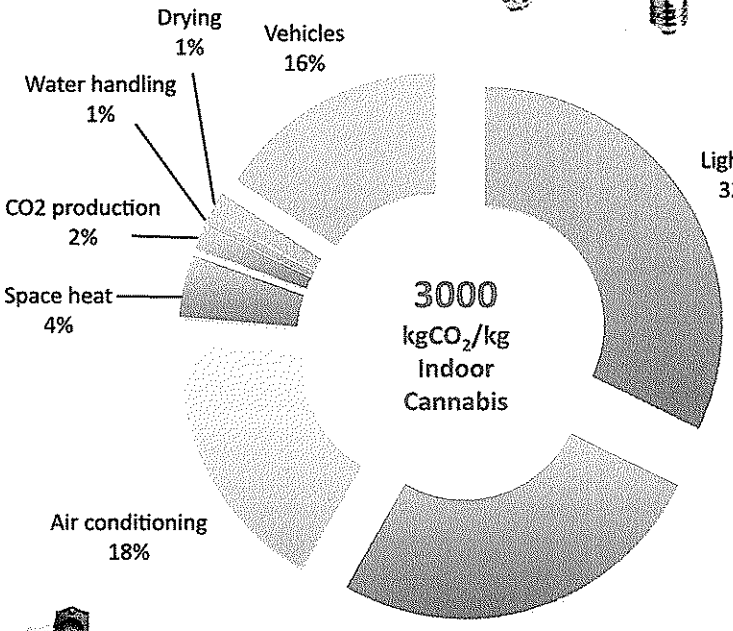
Water purifier

Submersible Water heater

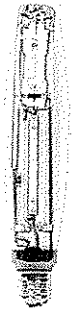


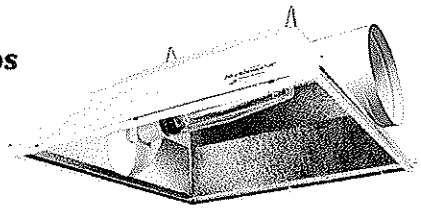
Vehicles

Pump

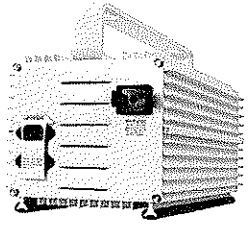


High-intensity lamps

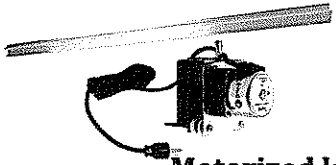




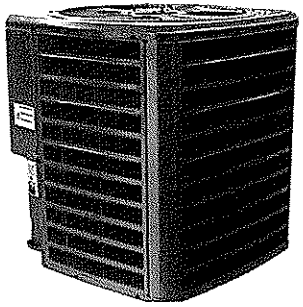
Ventilated Light fixture



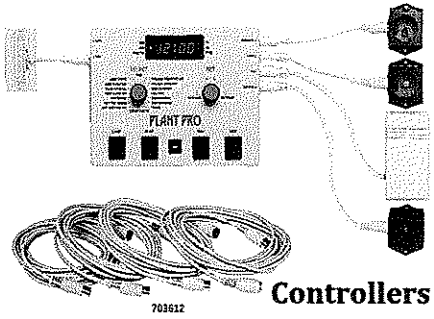
Ballast



Motorized lamp rails



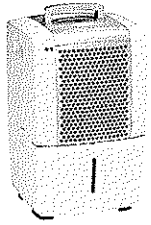
Air-conditioning



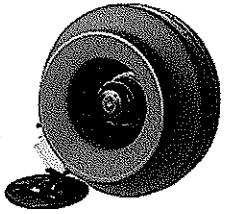
Controllers

Oscillating fan

Ventilation & Dehumid



Dehumidifier



In-line duct fan, coupled to lights

Table 1. Configuration, Environmental Conditions, and Setpoints		
Production parameters		
Growing module	16	square feet (excl. walking area)
Number of modules in a room	10	
Area of room	240	square feet
Cycle duration	78	days
Production continuous throughout the year	4.7	cycles
Illumination	*Leaf phase*	*Flowering phase*
Lamp type	Metal halide	High-pressure sodium
Watts/lamp	600	1000
Ballast losses (mix of magnetic & digital)	13%	13%
Lamps per growing module	1	1
Hours/day	18	12
Days/cycle	18	60
Daylighting	none	none
Ventilation		
Ducted luminaires with "sealed" lighting compartment	150	CFM/1000W of light (free flow)
Room ventilation (supply and exhaust fans)	30	ACH
Filtration	Charcoal filters on exhaust; HEPA on supply	
Oscilating fans: per module, while lights on	1	
Water		
Application	40	gallons/room-day
Heating	Electric submersible heaters	
	75	F
Space conditioning		
Indoor setpoint - day	82	F
Indoor setpoint - night	68-70	F
AC efficiency	10.0	SEER
Dehumidification	7x24	hours
CO2 production - target concentration (mostly natural gas combustion in space)	1500	ppm
Electric space heating	when lights off to maintain indoor setpoint	
Target indoor humidity conditions	40-50%	
Fraction of lighting system heat production removed by luminaire ventilation	30%	
Ballast location	Outside conditioned space	
Drying		
Space conditioning, oscillating fans, maintaining 50% RH, 70-80F	7	days
Electricity supply		
grid	85%	
grid-independent generation (mix of diesel, propane, and gasoline)	15%	
Vehicle use		
workers during production	2089	vehicle miles/cycle
wholesale distribution	750	vm/cycle
retail distribution (1 bounce)	3520	vm/cycle

Table 2. Assumptions & conversion factors

Service Levels		
Illuminance*	25-100,000	lux
Airchange rates*	30	changes per hour
Operations		
Cycle duration**	78	days
Cycles/year**	4.7	continuous production
Production module area*	16	square feet (excl. walking area)
Production module volume**	192	cubic feet
Airflow**	96	cubic feet per minute
Modules per room*	10	
Lighting		
Leafing phase		
Lighting on-time*	18	hrs/day
Duration*	18	days/cycle
Flowering phase		
Lighting on-time*	12	hrs/day
Duration*	60	days/cycle
Drying		
Hours/day*	24	hrs
Duration*	7	days/cycle
Equipment		
Average air-conditioning age	5	years
Air conditioner efficiency (SEER)	10	Minimum standard as of 1/2006
Fraction of lighting system heat production removed by luminaire ventilation	30%	
Diesel generator efficiency*	27%	55kW
Propane generator efficiency*	25%	27kW
Gasoline generator efficiency*	15%	5.5kW
Fraction of total prod'n with generators*	15%	
Water use [indoor]*	1	gallons/day-plant
Transportation: Production phase (10 modules)	25	miles roundtrip
Daily service (1 vehicle)	78	trips/cycle. Assume 20% live on site
Biweekly service (2 vehicles)	11	trips/cycle
Harvest (2 vehicles)	10	trips/cycle
Total vehicle miles**	2089	vehicle miles/cycle
Transportation: Distribution		
Amount transported wholesale	5	kg per trip
Mileage (roundtrip)	750	vm/cycle
Retail (0.25oz x 5 miles roundtrip)	3520	vm/cycle
Total**	4270	vm/cycle
Fuel economy, typical car [a]	22	mpg
Annual emissions, typical car [a]	5195	kg CO2
	0.416	kg CO2/mile
Annual emissions, 44-mpg car**	2598	kg CO2
	0.208	kg CO2/mile
Cross-country US mileage	2790	miles

Fuels		
Propane [b]	91,033	BTU/gallon
Diesel [b]	138,690	BTU/gallon
Gasoline [b]	124,238	BTU/gallon
Electric Generation Mix*		
Grid	85%	share
Diesel generators	8%	share
Propane generators	5%	share
Gasoline generators	2%	share
Emissions Factors		
Grid electricity - US [c]	0.609	kgCO2/kWh
Grid electricity - CA [c]	0.384	kgCO2/kWh
Grid electricity - non-CA US [c]	0.648	kgCO2/kWh
Diesel generator**	0.922	kgCO2/kWh
Propane generator**	0.877	kgCO2/kWh
Gasoline generator**	1.533	kgCO2/kWh
Blended generator mix**	0.989	kgCO2/kWh
Blended on/off-grid generation - CA**	0.475	kgCO2/kWh
Blended on/off-grid generation - US**	0.666	kgCO2/kWh
Propane combustion	63.1	kgCO2/MBTU
Prices		
Electricity price - grid (California - PG&E) [d]	$0.390	per kWh (Tier 5)
Electricity price - grid (US, excl. CA) [e]	$0.127	per kWh
Electricity price - off-grid**	$0.390	per kWh
Electricity price - blended on/off - CA**	$0.390	per kWh
Electricity price - blended on/off - US**	$0.166	per kWh
Propane Price [f]	$2.20	per gallon
Gasoline Price - US average [f]	$3.68	per gallon
Diesel Price - US average [f]	$3.98	per gallon
Wholesale price of Cannabis [g]	$4,000	$/kg
Production		
Plants per production module*	4	
Net production per production module [h]	0.7	kg/cycle
US production (2011) [i]	16,974	metric tonnes/y
California production (2011) [i]	5,922	metric tonnes/y
Fraction produced indoors [i]	33%	
US indoor production modules**	1,727,283	
Calif indoor production modules**	602,597	
Cigarettes per kg**	3,000	
Other		
Average new refrigerator	450	kWh/year
	173	kgCO2/year (US average)
Electricity use of a typical US home - 2009 [j]	11,646	kWh/year
Electricity use of a typical California home - 2009 [k]	6,961	kWh/year

* trade and product literature; interviews with equipment vendors

** calculated from other values

Table 3. Carbon footprint of indoor Cannabis Production
(Average US conditions)

	kWh/kg	kgCO2 emissions/kg	
Lighting	1,479	985	32.2%
Ventilation & Dehumid.	1,197	797	26.1%
Air conditioning	827	551	18.0%
Space heat	197	131	4.3%
CO_2 production	54	49	1.6%
Water handling	28	19	0.6%
Drying	73	48	1.6%
Vehicles		479	15.7%
Total	3,855	**3,059**	100.0%

Note: "CO2 production" represents combustion fuel to make on-site CO2. Assumes 15% of electricity is produced in off-grid generators. As the fuels used for CO2 contain moisture, additional dehumidification is required (and allocated here to the CO2 energy row). Air-conditioning associated with CO2 production (as well as for lighting, ventilation, and other incidentals) is counted in the air-conditioning category.

Table 4. Equivalencies								
Indoor Cannabis production consumes...	3%	of California's total electricity, and	8%	of California's household electricity	1%	of total US electricity, and	2%	of US household electricity
U.S. Cannabis production & distribution energy cost...	$5	Billion, and results in the emissions of	17	million tonnes per year of greenhouse gas emissions (CO2)	equal to the emissions of	3	million average cars	
U.S. electricity use for Cannabis production is equivalent to that of...	2	million average US homes						
California Cannabis production and distribution energy cost	$3	Billion, and results in the emissions of	4	million tonnes per year of greenhouse gas emissions (CO2)	equal to the emissions of	1	million average cars	
California electricity use for Cannabis production is equivalent to that of...	1	million average California homes						
A typical 4x4x8-foot production module, accomodating four plants at a time, consumes as much electricity as...	1	average U.S. homes, or	2	average California homes	or	28	average new refrigerators	
Every 1 kilogram of Cannabis produced using national-average grid power results in the emissions of...	2.8	tonnes of CO2	equivalent to	4.9	cross-country trips in a 44mpg car			
Every 1 kilogram of Cannabis produced using a prorated mix of grid and off-grid generators results in the emissions of...	3.1	tonnes of CO2	equivalent to	5.3	cross-country trips in a 44mpg car			
Every 1 kilogram of Cannabis produced using off-grid generators results in the emissions of...	4.3	tonnes of CO2	equivalent to	7.4	cross-country trips in a 44mpg car			
Transportation (wholesale+retail) consumes...	52	gallons of gasoline per kg	or	$1	billion dollars annually, and	479	kilograms of CO2 per kilogram of final product	
One Cannabis cigarette is like driving...	15	miles in a 44mpg car	emitting about	2	pounds of CO2, which is equivalent to operating a 100-watt light bulb for	17	hours	
Of the total wholesale price...	24%	is for energy (at average U.S. prices)						

Table 5. Indicators (Average US conditions)	per cycle, per production module	per year, per production module	
Energy Use			
Connected Load		3,039	watts/module
Power Density		190	watts/ft2
Elect	2,698	12,626	kWh/module
Fuel to make CO2	0.3	1.5	MBTU
Transportation fuel	37	172	gallons
On-grid results			
Energy cost	592	2,770	$/module
Energy cost		846	$/kg
Fraction of wholesale price		21%	
CO2 emissions	1,988	9,302	kg
CO2 emissions		2,840	kg/kg
Off-grid results (diesel)			
Energy cost	1,196	5,595	$/module
Energy cost		1,708	$/kg
Fraction of wholesale price		43%	
CO2 emissions	3,012	14,094	kg
CO2 emissions		4,303	kgCO2/kg
Blended on/off grid results			
Energy cost	682	3,194	$/module
Energy cost		975	$/kg
Fraction of wholesale price		24%	
CO2 emissions	2,141	10,021	kg
CO2 emissions		3,059	kgCO2/kg
Of which, indoor CO2 production	9	42	kgCO2
Of which, vehicle use			
Fuel use			
During Production		14	gallons/kg
Distribution		39	gallons/kg
Cost			
During Production		$50	$/kg
Distribution		$143	$/kg
Emissions			
During Production		124	kgCO2/kg
Distribution		355	kgCO2/kg

Table 6. Model	Energy type	Penetration	Rating	Number of 4x4x8-foot production modules served	Input energy per module	Units	Hours/day (leaf phase)	Hours/day (flower phase)	Days/cycle (leaf phase)	Days/cycle (flower phase)	kWh / cycle	kWh/year per production module
Light												
Lamps (HPS)	elect	100%	1000	1	1000	W		12		60	720	3,369
Ballasts (losses)	elect	100%	13%	1	130	W		12		60	94	438
Lamps (MH)	elect	100%	600	1	600	W	18		18		194	910
Ballast (losses)	elect	100%	13%	1	78	W	18		18		25	118
Motorized rail motion	elect	5%	5.5	1	0.3	W	18	12	18	60	0	1
Controllers	elect	50%	10	10	1	W	24	24	18	60	2	9
Ventilation and moisture control												
Luminare fans (sealed from conditioned space)	elect	100%	454	10	45	W	18	12	18	60	47	222
Main room fans - supply	elect	100%	242	8.1	30	W	18	12	18	60	31	145
Main room fans - exhaust	elect	100%	242	8.1	30	W	18	12	18	60	31	145
Circulating fans (18")	elect	100%	130	1	130	W	24	24	18	60	242	1,134
Dehumidification	elect	100%	1,035	4	259	W	24	24	18	60	484	2,267
Controllers	elect	50%	10	10	1	W	24	24	18	60	2	9
Spaceheat												
Resistance heat [when lights off]		90%	1,850	10	167	W	6	12	18	60	138	645
Carbon Dioxide												
Parasitic electricity	elect	50%	100	10	5	W	18	12	18	60	5	24
AC (see below)	elect	100%										
In-line heater	elect	5%	115	10	0.6	W	18	12	18	60	1	3
Dehumidification (10% adder)	elect	50%	104	0.4	26	W	18	12	18	60	27	126
Monitor/control	elect	50%	50	10	3	W	24	24	18	60	5	22
Water												
Heating	elect	100%	300	10	30	W	18	12	18	60	19	89
Pumping - irrigation	elect	100%	55	10	5.5	W	1	1	18	60	0	2
Drying												
Dehumidification	elect	75%	1,850	10	139	W		24		7	23	109
Circulating fans	elect	100%	130	5	26	W		24		7	4	20
Heating	elect	75%	1,850	10	139	W		24		7	23	109
Electricity subtotal	elect										2,119	9,918
Air-conditioning											579	2,709
Lighting loads											239	1,117
Loads that can be remoted	elect	100%	1,180	10	118	W					221	1,034
Loads that can't be remoted	elect	100%	450	10	45	W					84	394
CO2-production heat removal	elect	50%	1,118	16.7	34	W	18	12	18	60	35	164
Electricity Total	**elect**				**3,039**	**W**					**2,698**	**12,626**

ON-SITE FUEL	Units	Technology Mix	Rating (BTU/ hour)	Number of 4x4x8-foot production modules served	Input energy per module		Hours/day (leaf phase)	Hours/day (flower phase)	Days/cycle (leaf phase)	Days/cycle (flower phase)	MBTU or kgCO2/cycle	MBTU or kgCO2/year
On-site CO2 production												
Energy use	propane	45%	11,176	16.7	671	BTU/ho	18	12	18	60	0.3	1.5
CO2 production --> emissions	kg/CO2										20	93
Externally produced Industrial CO2		5%		1	0.011	gallonsCO2/hr	18	12	18	60	1	3
Weighted-average on-site / purchased	kgCO2										2	10
Weighted average on-site / purchased	kg CO2										9	42

Notes for Tables

[a]. U.S. Environmental Protection Agency. "Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks." http://www.epa.gov/oms/consumer/f00013.htm [accessed February 5, 2011]

[b]. *Energy Conversion Factors,* U.S. Department of Energy, http://www.eia.doe.gov/energyexplained/index.cfm?page=about_energy_units [Accessed February 5, 2011]

[c]. U.S. Department of Energy, "Voluntary Reporting of Greenhouse Gases Program" http://www.eia.doe.gov/oiaf/1605/ee-factors.html [Accessed February 7, 2011]. CA: Marnay, C., D. Fisher, S. Murtishaw, A. Phadke, L. Price, and J. Sathaye. 2002. "Estimating Carbon Dioxide Emissions Factors for the California Electric Power Sector." Lawrence Berkeley National Laboratory Report No. 49945. http://industrial-energy.lbl.gov/node/148

[d]. PG&E residential tariff as of 1/1/11, Tier 5 http://www.pge.com/tariffs/ResElecCurrent.xls [Accessed February 5, 2011]. In practice a wide mix of tariffs apply, but the relative shares are not known.

[e]. State-level residential prices, weighted by Cannabis production from [Reference 4], with actual tariffs and U.S. Energy Information Administration, "Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State," http://www.eia.doe.gov/electricity/epm/table5_6_a.html [Accessed February 7, 2011]

[f]. U.S. Energy Information Administration, Gasoline and Diesel Fuel Update (as of 2/14/2011) - see http://www.eia.gov/oog/info/gdu/gasdiesel.asp Propane prices - http://www.eia.gov/dnav/pet/pet_pri_prop_a_EPLLPA_PTA_dpgal_m.htm [Accessed April 3, 2011]

[g]. Montgomery, M. 2010. "Plummeting Marijuana Prices Create A Panic in Calif." http://www.npr.org/templates/story/story.php?storyId=126806429

[h]. Toonen, M., S. Ribot, and J. Thissen. 2006. "Yield of Illicit Indoor Cannabis Cultivation in the Netherlands." *Journal of Forensic Science*, 15(5):1050-4. http://www.ncbi.nlm.nih.gov/pubmed/17018080

[i]. See Reference 14 for derivation.

[j]. Total U.S. Electricity Sales: U.S. Energy Information Administration, "Retail Sales of Electricity to Ultimate Customers: Total by End-Use Sector" http://www.eia.gov/cneaf/electricity/epm/table5_1.html [Accessed March 5, 2011]

[k]. California Energy Commission. "Energy Almanac." http://energyalmanac.ca.gov/electricity/us_per_capita_electricity.html [Accessed February 19, 2011]. See also Total California Electricity Sales: California Energy Commission. 2009. *California Energy Demand: 2010-2020 -- Adopted Forecast.* Report CEC-200-2009-012-CMF), December 2009 (includes self-generation).

References

1. This report presents a model of typical production methodologies and associated transportation energy use. Data sources include equipment manufacturer data, trade media, the open literature, and interviews with horticultural supply vendors. All assumptions used in the analysis are presented in Table 2. The resultant normalized (per-kilogram) energy intensity is driven by the target environmental conditions, production process, and equipment efficiencies. While less energy-intensive processes are possible (either with lower per-unit-area yields or more efficient equipment and controls), much more energy-intensive scenarios are also possible (e.g., rooms using 100% recirculated air with reheat, hydroponics, and loads not counted here such as well-water pumps and water purification systems). The assumptions about vehicle energy use are likely conservative, given the longer-range transportation associated with interstate distribution. Some localities (very cold and very hot climates) will see much larger shares of production indoors, and have higher space-conditioning energy demands than the typical conditions assumed here. Some authors [See Plecas, D. J. Diplock, L. Garis, B. Carlisle, P. Neal, and S. Landry. *Journal of Criminal Justice Research,* Vol. 1 No 2., p. 1-12.] suggest that the assumption of 0.75kg yield per production module per cycle is an over-estimate. Were that the case, the energy and emissions values in this report would be even higher, which is hard to conceive. Additional key uncertainties are total production and the indoor fraction of total production (see note 14), and the corresponding scaling up of relatively well-understood intensities of energy use per unit of production to state or national levels by weight of final product. Greenhouse-gas emissions estimates are in turn sensitive to the assumed mix of on- and off-grid power production technologies and fuels, as off-grid production tends to have substantially higher emissions per kilowatt-hour than grid power. Costs are a direct function of the aforementioned factors, combined with electricity tariffs, which vary widely across the country and among customer classes. More in-depth analyses could explore the variations introduced by geography and climate, alternate technology configurations, and production techniques.
2. U.S. Department of Justice. *National Drug Threat Assessment: 2010* http://www.justice.gov/ndic/pubs38/38661/marijuana.htm#Marijuana
3. World Drug Report: 2009. United Nations Office on Drugs and Crime, p. 97. http://www.unodc.org/unodc/en/data-and-analysis/WDR-2009.html For U.S. conditions, indoor yields per unit area are estimated as up to 15-times greater than outdoor yields.
4. Hudson, R. 2003. "Marijuana Availability in The United States and its Associated Territories." Federal Research Division, Library of Congress. Washington, D.C. (December). 129pp. See also Gettman, J. 2006. "Marijuana Production in the United States," 29pp. http://www.drugscience.org/Archive/bcr2/app2.html
5. See http://www.justice.gov/dea/programs/marijuana.htm
6. Anderson, G. 2010. "Grow Houses Gobble Energy." *Press Democrat*, July 25.See http://www.pressdemocrat.com/article/20100725/ARTICLES/100729664
7. Quinones, S. 2010. "Indoor Pot Makes Cash, but Isn't Green." *SFGate*, http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/10/21/BAPO1FU9MS.DTL
8. A study by RAND appears to have severely underestimated the true energy costs. See J. P. Caulkins. 2010. "Estimated Cost of Production for Legalized Cannabis." RAND Working Paper, WR-764-RC. July. Although the study over-estimates the hours of lighting required,

it under-estimates the electrical demand and applies energy prices that fall far short of the inclining marginal-cost tariff structures applicable in many states, particularly California.

9. Lehman, P. and P. Johnstone. 2010. "The Climate-Killers Inside." *North Coast Journal*, March 11.
10. Harvey, M. 2009. "California Dreaming of Full Marijuana Legalisation." *The Sunday Times*, (September). http://business.timesonline.co.uk/tol/business/industry_sectors/health/article6851523.ece
11. See Gettman, *op cit.*, at ref 4.
12. See Gettman, *op cit.*, at ref 4.
13. U.S. Department of Health and Human Services, SAMHSA, 2009 National Survey on Drug Use and Health (September 2010). https://nsduhweb.rti.org/
14. Total Production: The only official domestic estimate of U.S. Cannabis production was 10,000 to 24,000 tonnes for the year 2001. Gettman (*op cit.*, at ref. 4) conservatively retained the lower value for the year 2006. This 2006 base is adjusted to 2011 values using 10.9%/year net increase in number of consumers between 2007 and 2009, per U.S. Department of Health and Human Services (*op cit.*, at ref. 12). The result is approximately 17 million tonnes of total production annually (indoor and outdoor). Indoor Share of Total Production: The three-fold changes in potency over the past two decades, reported by federal sources, are attributed at least in part to the shift towards indoor cultivation [See http://www.justice.gov/ndic/pubs37/37035/national.htm and Hudson *op cit.*, at ref 4]. A weighted-average potency of 10% THC (U.S. Office of Drug Control Policy. 2010. "Marijuana: Know the Facts"), reconciled with assumed 7.5% potency for outdoor production and 15% for indoor production implies 33.3%::67.7% indoor::outdoor production shares. For reference, as of 2008, 6% of eradicated plants were from indoor operations, which are more difficult to detect than outdoor operations. A 33% indoor share, combined with per-plant yields from Table 2, would correspond to a 4% eradication success rate for the levels reported (415,000 indoor plants eradicated in 2009) by the DEA (*op cit.*, at ref 5). Assuming 400,000 members of medical Cannabis dispensaries in California (each of which is permitted to cultivate), and 50% of these producing in the generic 10-module room assumed in this analysis, output would slightly exceed this study's estimate of total statewide production. In practice, significant indoor production is no doubt conducted outside of the medical marijuana system.
15. Koomey, J., et al. 2010. "Defining A Standard Metric for Electricity Savings." *Environmental Research Letters*, 5, doi:10.1088/1748-9326/5/1/014017.
16. Overcash, Y. Li, E. Griffing, and G. Rice. 2007. "A life cycle inventory of carbon dioxide as a solvent and additive for industry and in products." *Journal of Chemical Technology and Biotechnology*, 82:1023–1038.
17. Specifically, 2% of total Provincial electricity use or 6% of residential use, as reported by BC Hydro in Garis, L. 2008. "Eliminating Residential Hazards Associated with Marijuana Grow Operations and The Regulation of Hydroponics Equipment," British Columbia's Public Safety Electrical Fire and Safety Initiative, Fire Chiefs Association of British Columbia, 108pp. See also Bellett, G. 2010. "Pot Growers Stealing $100 million in Electricity: B.C. Hydro studies found 500 Gigawatt hours stolen each year." *Alberni Valley Times*. October 8. Analysis by B.C. Hydro in 2006 identified nearly 18,000 residential utility accounts in Vancouver with suspiciously high electricity use [see Garis 2008]. There were an estimated 10,000 indoor operations in B.C. in the year 2003, generating $1.24B in wholesale revenue [See Plecas et al., *op cit.*, at ref 1.].

18. See, e.g., this University of Michigan resource: http://www.hrt.msu.edu/energy/Default.htm
19. "Environmental Impacts of Pot Growth." 2009. *Ukiah Daily Journal.* (posted at http://www.cannabisnews.org/united-states-cannabis-news/environmental-impacts-of-pot-growth/)
20. For observations from the building inspectors community, see http://www.nachi.org/marijuana-grow-operations.htm
21. See Garis, L., *op cit.,* at ref 17.
22. The City of Fort Bragg, CA, has implemented elements of this in *TITLE 9 – Public Peace, Safety, & Morals,* Chapter 9.34. http://city.fortbragg.com/pages/searchResults.lasso?-token.editChoice=9.0.0&SearchType=MCsuperSearch&CurrentAction=viewResult#9.32.0