Fw: Study Session Item #14 - Intel Ocotillo Campus Amendment No . 4

Susan Fiala to: Erica Barba 08/11/2014 02:54 PM

History: This message has been replied to and forwarded.

Erica: A response from Intel in reference to the packet provided by Mr. Frank Hand.

Thank you,
Susan Fiala
City Planner
Planning Division
City of Chandler, 215 E Buffalo ST, 85225
(480) 782-3067
Susan.Fiala@chandleraz.gov

----- Forwarded by Susan Fiala/COC on 08/11/2014 02:54 PM -----

From: "Bagley, Jason" <jason.bagley@intel.com>
To: "'Susan.Fiala@chandleraz.gov'" <Susan.Fiala@chandleraz.gov>, "Lenz, Doug" <doug.lenz@intel.com>
Cc: "Forbis, Jeanne A" <jeanne.a.forbis@intel.com>, "Sutherland, Rachel" <rachel.sutherland@intel.com>, "Levin, Renee E" <renee.e.levin@intel.com>, "Blawn, Aaron" <aaron.blawn@intel.com>
Date: 08/11/2014 02:41 PM
Subject: RE: Study Session Item #14 - Intel Ocotillo Campus Amendment No. 4

Susan,
Thank you for sharing this. Frank's comments are consistent with those he made during our meeting. Some of his statements concerning Intel are not quite correct and I wanted to make certain we were clear:

- Intel is not bringing in any new power lines. That is an SRP project and is governed by a separate regulatory and review process. Intel has identified space to locate the proposed southern substation on Intel property if that is what SRP and the ACA determine. This is reflected the PDP amendment.
- We were clear that the voluntary 1,000 foot setback was to provide residents a buffer from manufacturing structures. However, *if* Intel were to construct additional factories at the site, we would at some point need to address additional parking for employees. We would most likely maintain the approach we have used at the site, which is surface parking within reasonable walking distance to a building. While surface parking could extend into the 1,000 foot setback on the south side of the site, Intel does, and would continue to maintain, a significant landscape barrier with trees along the Sun Lakes/Intel property line.
- Regarding the question of environmental reports being conducted, Intel regularly assesses environmental risks and impacts associated with our operations. We follow all applicable environmental regulations and are very sensitive to the health and safety of our employees, our suppliers and other visitors, as well as our surrounding community. We are very transparent in making our environmental performance data public and publish those data on a quarterly basis.

Throughout Intel's three-plus decades of operations in Chandler, we have demonstrated a consistent commitment to positive relationships with our neighbors. We will continue to do all we can to ensure that relationship is open and productive. We appreciated the opportunity to meet with Mr. Hand and

will continue to work with him. Please let me know if you have any further questions or concerns. Thanks-

Jason Bagley
Government Affairs Manager
Intel Corporate Affairs
Southwestern United States
480.552.6832
jason.bagley@intel.com
From: Susan.Fiala@chandleraz.gov [mailto:Susan.Fiala@chandleraz.gov]
Sent: Monday, August 11, 2014 2:00 PM
To: Bagley, Jason; Lenz, Doug
Subject: Fw: Study Session Item #14 - Intel Ocotillo Campus Amendment No. 4

FYI...Just received this from Clerks office.

Susan Fiala
City Planner
Planning Division
City of Chandler, 215 E Buffalo ST, 85225
(480) 782-3067
Susan.Fiala@chandleraz.gov

----- Forwarded by Susan Fiala/COC on 08/11/2014 01:58 PM -----

From: Erica Barba/COC@CHANDLERAZ.GOV
To: Rich Dlugas/COC@chandleraz.gov, Marsh Reed/COC@chandleraz.gov, Nachie Marquez/COC@chandleraz.gov, David Bigos/COC@chandleraz.gov
Cc: Rommel Cordova/COC@chandleraz.gov, Marla Paddock/COC@chandleraz.gov, Susan Fiala/COC@Chandleraz.gov, Jeff Kurtz/COC@chandler
Date: 08/11/2014 01:51 PM
Subject: Study Session Item #14 - Intel Ocotillo Campus Amendment No. 4

Hi All,

Frank Hand from Sun Lakes delivered the attached for Council and asked that it be made part of the "official record". I will upload and provide copies at the dais.

Thanks!
Erica Barba
City Clerk Management Assistant
City of Chandler, Arizona
City Clerk's Office

Add info #14

AUG 14 2014

To: Mayor Jay Tibshraeny City Council

Vice Mayor Rick Heumann City Council

Councilmember Trinity Donovan

Councilmember Nora Ellen

Councilmember Kevin Hartke

Councilmember Jeff Weninger

Councilmember Jack Sellers

From: Frank Hand, Sun Lakes Homeowner

9517 E Sundune Dr, Sun Lakes AZ 85248

Phone 480-802-7277

Subject: Proposed PDP 14-0007 Intel Ocotillo Campus Amendment NO. 4

Chandler City Council:

I am 85 years old and an original homeowner in the Sun Lakes Oakwood development. My wife and I made numerous trips from California scouting for the best place for our retirement. We eventually found Sun Lakes and walked the area and picked out a lot. My home is about one and a half blocks from the North Dobson gate, which is the boundary to Intel and Sun Lakes properties. We have approximately 4000 retired people here on our side of the fence in the Oakwood development. This is a senior retirement community with older people the majority of the populous. Some of these people have health issues that are daily life treating. Many have breathing problems; some have to carry Oxygen. Fumes from diesel engines exhausts are toxic. Older people have an in-tolerance to diesel exhaust fumes which could be fatal. The North boundary homes backyards end at the common wall. Intel proposes to build a parking lot on the other side. Residents are very scared and threatened. Some talk of selling their homes. The area is threatened as an undesirable location to move and homes will drop in price and be hard to sell. Diesel engines are somewhat noisy. They are in new and old trucks, pickups and passenger vehicles. The same can be said for gasoline engine exhaust.

In my opinion and others, Parking lots are toxic as well. They create a heat island and increase temperature in the local area. During the day they absorb short wave radiation and in the evening release long wave radiation from the asphalt which is toxic and create higher temperatures. If the parking lot is sealed with a sealer that is a wrong type to use it could be more toxic. I am not an authority in this subject. I used Google as my library to find out about parking lots and diesel engines. I have copied some of the information and I am submitting four attachments that were informative. I hope you will find time to read the material.

I went to the City Planning Commission on July 16, 2014 and made a formal statement opposing PDP14-0007. I contacted Intel and asked if it were possible to set up a meeting with them. They were very gracious and the meeting was held. They were good listeners, participated in the meeting, and shared what was proposed, in the PDP Amendment, and why. They are proposing drawing a red line a thousand feet back from the common fence. On their side of the red line, futures build out of FAB units and necessary buildings would take place in the future. On our side of the red line they would build a parking lot, literally in our back yards. Prevailing breezes, wind, would or could blow toxic fumes into our backyards', homes. The heat island effect as downtown Phoenix could

prevail and raise the temperature around us. Intel works around the clock and vehicles coming in and going out would be disruptive and noisy. Intel is a city all in its own and has plenty of vacant land location within their city to build a parking lot somewhere else, not in their neighbors' back yard. The 1000 foot red line setback on our side should remain a buffer zone. We often hear engines running at night from the Intel side. I sometimes hear the noise coming into my bathroom vent at night.

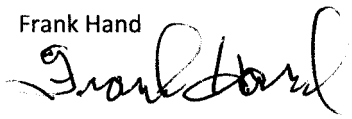
I proposed in the meeting that we need a buffer zone on our side of the red line. That they should build the parking lot away from our back yards. My suggestion is that where the new North large parking lot is now a blight on Intel's property, to build a multi level structure below and above ground for existing parking needs. This would take care of today and future parking needs. Also that the parking area should be green, trees, shrubbery, etc. The Southern, parking lot proposal should be abandoned and a buffer zone built on our side of the red line. This could be called Intel Park. It is always enjoyable to take visiting guests and drive from the 202 freeway Price corridor and see all the beautiful buildings, water features, and landscape. The Southern end of the corporate corridor is anchored by Intel property. What was once a beautiful agricultural location has this vast future parking lot of asphalt?

Intel plans to bring in a 230 KVA power line and establish a sub- station on their side of the red line boundary. Security is paramount here and safety to the homeowners. Sitting on the edge of the buffer zone creates easy access to someone, groups that might want to sabotage the substation. This is 230,000 volts and high towers supporting the transmission lines. Magnetic affects could be dangerous to health, TV, radio reception, etc. Again why is Intel putting this in their neighbor's back yard? Why wouldn't they put the substation in the North end of their property, away from neighbor's homes and highly viable to their security forces?

I'm just a concerned resident and I know you will do your job. I thank all of you for serving our beautiful city of Chandler.

Best Regards,

Frank Hand



Attachments submitted.

A Studies: Health risk from toxic pavement sealant greater than previously believed.

B Diesel exhaust fumes are a major cancer risk' and as deadly as asbestos and mustard gas.

C. Federal standards for Diesel Engine Noise Emissions.

D. The Urban Heat Island (UHI) Effect.

Notes

1. The four attachments submitted in this correspondence are printed from Goggles response to my questions.

2. When the planning Commission and Intel were asked if an environmental report had been done, their response was, we don't know. Intel states that a report probably would be done on the final build out?

Studies: Health risk from toxic pavement sealant greater than previously believed

Friday Feb 17, 2012 3:53 AM

Coal tar sealant is applied at a study site at the University of Texas in Austin.

By Robert McClure, InvestigateWest

When you think of pollution, you might picture an industrial center like Camden, N.J., or Jersey City. But new research shows that when it comes to a potent class of cancer-causing toxic chemicals, many American parking lots are a lot worse.

New studies paint an increasingly alarming picture – particularly for young children – about how these chemicals are being spread across big swaths of American cities and suburbs by what may seem an unlikely source – a type of asphalt sealer. These sealants are derived from an industrial waste, coal tar (http://www.osha.gov/SLTC/healthguidelines/naphtha-coaltar/recognition.html).

Four new studies (links are at the end of this article) announced this week further implicate coal tar-based asphalt sealants as likely health risks. The creosote-like material typically is sprayed onto parking lots and driveways in an effort to preserve the asphalt. It also gives the pavement a dark black coloring that many people find attractive.

Coal tar is a byproduct of the steelmaking industry. In 1992, the U.S. Environmental Protection Agency declared that it would not be classified as a hazardous waste, even though it met the characteristics of one, because it could be recycled for uses that include coating asphalt. That meant steel mills didn't have to pay for costly landfilling or incineration of the waste.

Only in recent years have scientists discovered the ill effects of this practice.

Coal tar sealants are used most heavily in the eastern United States, but were applied in all 50 states until Washington state banned the products last year. More than a dozen local governments, including Washington, D.C., and Austin, Texas, also have banned the coal tar sealants in favor of the other major type of sealant, which is asphalt-based.

Asphalt-based sealants contain about 1/1000th the concentration of the cancer-causing chemicals that coal tar-based products do. Home Depot and Lowe's stores have dropped the coal tar sealants from their product lines, but still some 85 million gallons of the coal tar-based sealants are applied annually in the United States.

The new research, published in peer-reviewed science journals, focuses on a class of chemicals found in coal tar and known as "polycyclic aromatic hydrocarbons (http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=121&tid=25)," or PAHs. Previously, researchers believed that people's exposure to PAHs came primarily through food, which contains trace amounts produced primarily from smoking food or cooking it at high temperatures in practices such as grilling, roasting, and frying. PAHS are produced when any organic matter burns.

The new research shows:

- It appears that children – especially those from 3 to 5 years old – living by coal tar-sealed parking lots and driveways are getting a bigger dose of PAHs from house dust than from their food. The kids who put their hands in their mouth most often are likely receiving 9 ½ times more exposure through

house dust than through food, according to research led by E. Spencer Williams, a Baylor University human health risk assessment expert. That's just from the house dust. When the kids are outside in the yard or playing on coal tar-sealed pavement, they likely are picking up much larger doses.

- While researchers previously theorized that airborne PAHs come mostly from power plants, factories and cars' and trucks' tailpipe emissions, U.S. Geological Survey (http://tx.usgs.gov/coring/allthingssealcoat.html) researchers measured large amounts vaporizing into the air off coal tar-sealed parking lots. The concentrations coming off parking lots in suburban Austin, where the researchers are based, were higher than in centers of heavy industry, including Jersey City and Camden, N.J.; Chicago; London and Manchester, England; and Guangzhou, China. The Austin parking lots tested were three to eight years old. Much more off-gassing occurs in the first few years after the sealants are applied, researchers said.
- Concentrations measured four feet above the coal tar-sealed lots in some cases exceeded health-protection guidelines recommended by a European Union science panel to protect against cancer. The United States has no similar guidelines.
- Extrapolating from the 85 million gallons of coal tar sealants laid down annually and the out-gassing rates measured in Austin, Geological Survey researchers calculated that nationwide, more PAHs are getting into the air from coal tar-sealed parking lots, driveways and playgrounds than from all the auto and truck exhaust.

"That's a lot," said Barbara Mahler, a USGS scientist involved in the research.

Researchers previously had shown that coal tar-sealed parking lots were shedding tiny bits of the material, which was washed by rain into nearby waterways – killing, sickening and maiming aquatic creatures such as salamanders, minnows and, importantly, bugs at the base of the food chain. The chemicals kill tadpoles, cause tumors on fish, stunt growth of aquatic creatures and reduce the number of species able to live in a waterway.

As a result of being washed into waterways by stormwater, these chemicals' concentrations have been rising over the last two decades, even as levels of most contaminants are headed down, Geological Survey researchers showed.

The chemicals are getting into the house dust, researchers think, when small bits are eroded off pavement and tracked into nearby homes.

Scientists also had previously demonstrated that toxic constituents of coal tar were showing up in the dust of homes adjacent to parking lots and driveways, raising questions about health effects on children in those homes, especially toddlers who frequently put their hands in their mouths. Coal tar is known to cause cancer in humans, as well as genetic mutations in lab animals.

One of the new studies helps quantify that risk. Kids who are average in terms of how often they put their hands into their mouths are getting 2 ½ times as many PAHs from house dust as from food, while those in the 95th percentile of hand-to-mouth behavior – they do it more than 94 percent of other kids – get 9 ½ times as much from the dust.

Researchers still would like to know how much of a toxic dose those same kids are getting when they play outside in yards next to coal tar-sealed asphalt, or on the asphalt itself. The level of cancer-causing chemicals in the dust on the asphalt itself has been measured at about 37 times the levels found in house dust.

"Those concentrations are a good bit higher and this study doesn't include that at all," said Williams, the Baylor researcher. "That may be important because just one little fingerful could be a relevant dose," meaning one that worries health experts.

While researchers have known about contamination of water and dust, the findings about air pollution are new. Significant amounts of PAHs continue to vaporize off coal tar-sealed lots even years after the sealant is put down.

"When we look at a seal-coated parking lots, in any direction we look we see these really strongly elevated concentrations," said Peter Van Metre, a U.S. Geological Survey scientist based in Austin. Of the dust on the coal tar-sealed pavement, he said: "It would just take a tiny amount of that to be a large enough dose for it to be significant."

Companies that sell and use the coal tar sealants have previously disputed the growing body of evidence of the coal tar sealants' danger being amassed by scientists from the Geological Survey, the University of New Hampshire, Baylor and other institutions.

Repeated attempts this week to reach an industry representative, Anne LeHuray, executive director of the Pavement Coatings Technology Council (http://www.pavementcouncil.org/), for comment on the new studies were unsuccessful. In an email on Thursday, LeHuray said she was tied up at a meeting of the pavement council in Memphis.

Generally, the pavement council has attacked previous coal tar research on technical grounds (http://www.pavementcouncil.org/pavementcouncil/setacabstract.pdf).

Read previous articles on coal tar sealants:

Study sees parking lot dust as a cancer risk (http://www.msnbc.msn.com/id/34809699/ns/us_news-environment/t/study-sees-parking-lot-dust-cancer-risk/)

State bans coal tar sealants in big win for foes (http://www.msnbc.msn.com/id/42917004/ns/us_news-environment/t/state-bans-coal-tar-sealants-big-win-foes/)

The pavement council has fought bans – sometimes successfully – when they have been proposed by local and state governments. In addition to the local governments that have forbidden use of the coal tar sealants (http://coaltarfreeamerica.blogspot.com/p/cts-bans.html), some governments have placed restrictions on their use, including the state of Minnesota and the California Department of Transportation. Restrictions also are in effect in more than 40 Illinois municipalities.

U.S. Rep. Lloyd Doggett, a Democratic congressman from the Austin area, has previously filed legislation calling for a nationwide ban on coal tar sealants. He plans to refile the legislation, a Doggett spokeswoman said, but is currently embroiled in a redistricting fight.

Tom Ennis, an Austin city official who helped get coal tar sealants banned there, has now launched a campaign to support a nationwide ban.

"You're looking at a big urban air quality" problem, Ennis said. "It's completely unacceptable and something needs to be done."

The studies announced this week appeared in the science journals Environmental Science and Technology (http://tx.usgs.gov/coring/pubs/MahlerESTsealcoatFeature2012.pdf), Chemosphere (http://tx.usgs.gov/coring/pubs/VanMetre2012volatilizationin-uselotsChemos.pdf), Atmospheric Environment (http://tx.usgs.gov/coring/pubs/VanMetre2012PAHvolPicklelAtmEnv.pdf), and Environmental Pollution (http://www.sciencedirect.com/science/article/pii/S0269749112000279).

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Russia Still Sends Military Gear to Rebels After MH17 Downing, U.S. Says (http://investigations.nbcnews.com/_news/2014/07/22/24947438-russia-still-sends-military-gear-to-rebels-after-mh17-downing-us-says?lite) 31 comments

Boston Marathon Bombing: Tsarnaev Gun Mystery Solved, Say Officials (http://investigations.nbcnews.com/_news/2014/07/22/24946173-boston-marathon-bombing-tsarnaev-gun-mystery-solved-say-officials?lite) 7 comments

20 MORE...

DISCUSSIONS

44 previous comments VIEW

rkN4$ (http://durobi.newsvine.com/) commented

17, 2012

#45

And Next week we will see an announcement Saying if you eat the coal Tar it will prevent cancer. But then it will probably be the main cause of global warming.

0 REPLIES

SHARE

bba-1946427 (http://bubba1946427.newsvine.com/) commented

17, 2012

#46

US spends 1 billion Dollars to study if Death really kills you;-) Study inconclusive?

1 REPLY

SHARE

bubba-1946427 (http://bubba1946427.newsvine.com/) replied

Feb 17, 2012

#46.1

The results of the Survey were as follows!

50% of those surveyed the Living!

50% answered no they were still alive so death did not kill them!

33% stated they did not know!

the rest of were politicians and they state the feed off the living and were unable to understand the question!

The other 50% of the survey the dead refused to answer!

SHARE

vlsAdvacut (http://devlsadvacut.newsvine.com/) commented

17, 2012

#47

(Neutragena® T/Gel®, DHS® **Tar**, Tegrin® Medicated, Pentrax®, Tersa-**Tar**®, Ionil T® Plus, Denorex®, Tru-**Tar**®, Duplex®T)

Coal tar shampoo anyone?

Why Seal Coat Your Parking Lot?

Posted on January 28, 2012 by Bill Holmes

Seal Coating is the most important element of a pavement management plan. Properly applied seal coat protects asphalt surfaces against gasoline, oil, salt, water and ultraviolet rays.

Asphalt is preferred for parking lots because it provides excellent waterproofing, flexibility and adhesive properties at an affordable cost. In spite of asphalt's benefits, there are serious considerations related to chemical corrosion, heat and ultraviolet rays.

These elements lead to asphalt breakdown, causing discoloration, cracks, voids and pot holes. Applying a protective sealcoat resists natural and man-made elements and maintains your parking lot's aesthetic appeal.

Benefits of Seal Coating

Beautification:
Pavement looks new, projecting a positive image for your company and your investment property.

Slows Oxidation and Water Penetration:
Sealcoating fills surface voids, reducing exposure to oxygen, moisture, and UV rays.

Resists Oil & Gas Spills:
Gasoline and oil breaks down unsealed asphalt. Seal coating reduces gas and oil penetration into the asphalt.

IntegrityIntegrity

Paving & Coatings Paving & Coatings

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- Flexibility and quick response time
- The best price value around!

B

Mail Online

Diesel exhaust fumes are 'major cancer risk' and as deadly as asbestos and mustard gas, says World Health Organisation

- **Diesel exhaust found to cause lung cancer and associated with an increased risk of bladder cancer**
- **WHO says the fumes belong in same category as mustard gas and asbestos**
- **Risks are on a level with passive smoking**

By Claire Bates

Published: 02:12 EST, 13 June 2012 | Updated: 03:52 EST, 13 June 2012

Diesel engine exhaust fumes cause cancer and belong in the same potentially deadly category as asbestos, arsenic and mustard gas, according to the World Health Organisation.

The France-based International Agency for Research on Cancer (IARC), part of the WHO, has reclassified diesel exhausts from 'probable' carcinogens to a group of substances that have definite links to cancer.

Research has shown that regular exposure to diesel fumes is as likely to cause cancer as passive smoking.

Health officials have now called for governments to act on 'cleaning-up' the fumes emitted from vehicle exhausts.

1

WHO have raised the status of diesel exhaust from 'probable carcinogen' to carcinogen

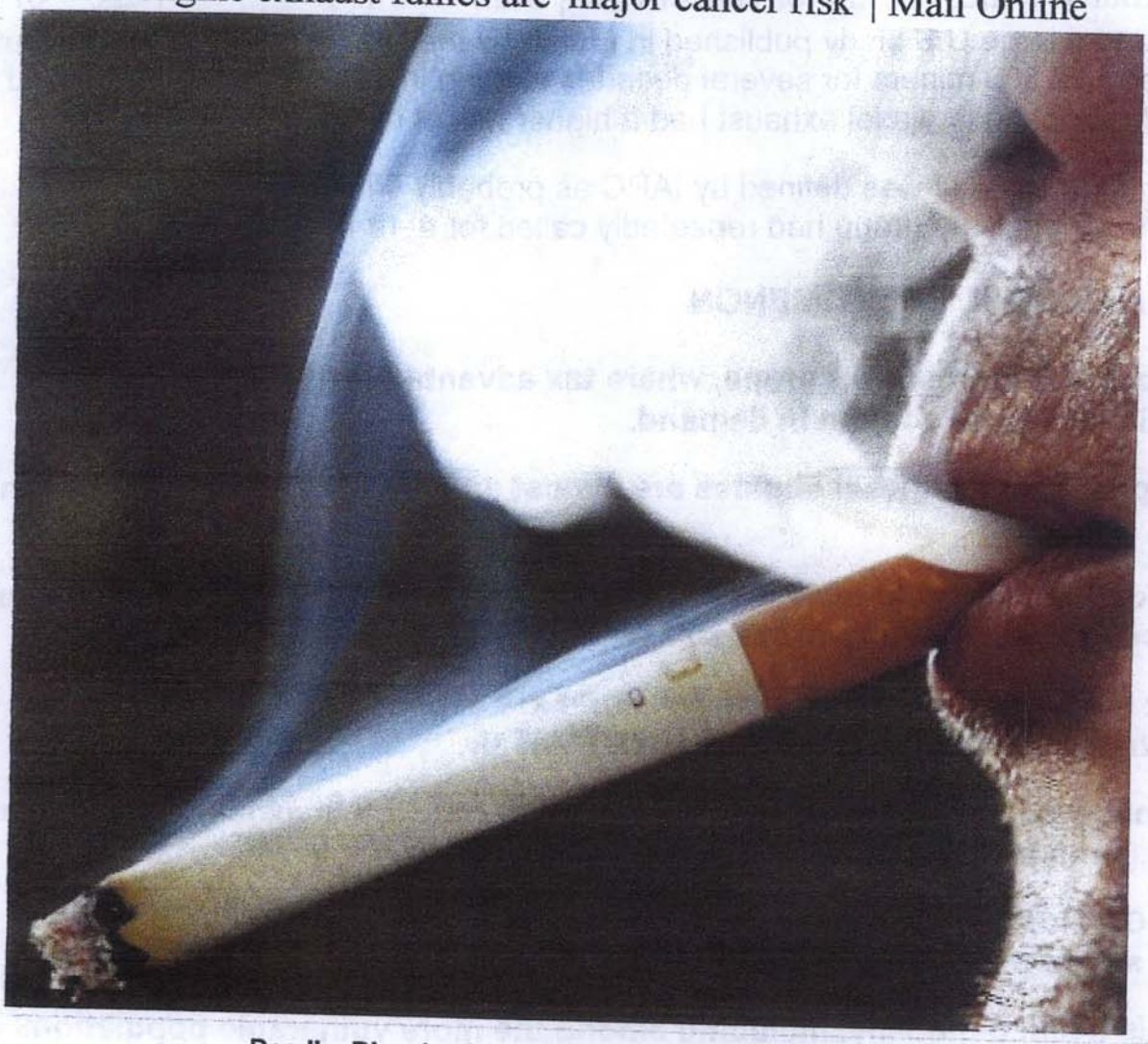
The experts, who said their decision was unanimous and based on 'compelling' scientific evidence, urged people across the world to reduce exposure to diesel fumes as much as possible.

'The (expert) working group found that diesel exhaust is a cause of lung cancer and also noted a positive association with an increased risk of bladder cancer,' it said in a statement.

The decision is a result of a week-long meeting of independent experts who assessed the latest scientific evidence on the cancer-causing potential of diesel and gasoline exhausts.

It puts diesel fumes in the same risk category as noxious substances such as asbestos, arsenic, mustard gas, alcohol and tobacco.

'It's on the same order of magnitude as passive smoking,' said Kurt Straif, director of the IARC department that evaluates cancer risks.



Deadly: Diesel exhaust fumes pose the same cancer risk as passive smoking

'This could be another big push for countries to clean up exhaust from diesel engines.'

Dr Lesley Walker, director of cancer information at Cancer Research UK, said: 'This report, from an international panel of experts, sends a clear message that diesel fumes can cause lung cancer.

'The evidence of harmful health effects of diesel, particularly for people exposed to high levels through their jobs, has been accumulating for many years.

'But, the overall number of lung cancers caused by diesel fumes is likely to be a fraction of those caused by smoking tobacco.

'In the UK there are already guidelines in place to protect employees from the harmful effects of diesel fumes. Employers and workers should take appropriate action to minimise exposure in the workplace.'

Christopher Portier, chairman of the IARC working group, said the group's conclusion 'was unanimous, that diesel engine exhaust causes lung cancer in humans'.

'Given the additional health impacts from diesel particulates, exposure to this mixture of chemicals should be reduced worldwide,' he said in a statement.

The group pointed to a large U.S study published in March by the US National Cancer Institute. That paper analysed 12,300 miners for several decades starting in 1947. Researchers found that miners heavily exposed to diesel exhaust had a higher risk of dying from lung cancer.

Although diesel engine exhaust was defined by IARC as probably carcinogenic to humans - group 2A - in 1989, an advisory group had repeatedly called for a re-evaluation since 1998.

DIESEL CARS: A GLOBAL PHENOMENON

Diesel cars are popular in western Europe, where tax advantages have encouraged technological advances and a boom in demand.

Outside of Europe and India, diesel engines are almost entirely confined to commercial vehicles.

German car makers are trying to raise awareness for diesels in the United States, where the long distances travelled on highways suit diesel engines.

IARC noted that large populations all over the world are exposed to diesel exhaust in everyday life, whether through their jobs or in ambient air.

'People are exposed not only to motor vehicle exhausts but also to exhausts from other diesel engines...(such as diesel trains and ships) and from power generators,' it said.

IARC's director Christopher Wild said that against this background, their conclusion 'sends a strong signal that public health action is warranted'.

'This emphasis is needed globally, including among the more vulnerable populations in developing countries where new technology and protective measures may otherwise take many years to be adopted,' he said in a statement.

Today's announcement has caused consternation among car and truck manufacturers, who claim that diesel fuel engines are constantly being refined.

The global auto industry had argued diesel fumes should be given a less high-risk rating to reflect tighter emissions standards.

Reacting to the decision, Allen Schaeffer, executive director of the Washington-based Diesel Technology Forum said diesel engine and equipment makers, fuel refiners and emissions control technology makers have invested billions of dollars in research into technologies and strategies to reduce emissions.

'New technology diesel engines, which use ultra-low sulphur diesel fuel, advanced engines and emissions control systems, are near zero emissions for nitrogen oxides, hydrocarbons and particulate matter,' he said in a statement.

Alan Baum, principal of Baum and Associates in Michigan, said it is unlikely that the IARC report will cause companies to change plans for expansion of diesel fuel in the United States.

4

About 5.5 per cent of new autos, including light-duty pickup trucks, sold in the United States run on diesel, said Baum, and he said that figure is expected to rise to 8 or 9 percent by 2015.

IARC said it had considered recent advances in technology which had cut levels of particulates and chemicals in exhaust fumes, particularly in developed economies, but said it was not yet clear how these might translate into health effects.

'Research into this question is needed,' it said.

'In addition, existing fuels and vehicles without these modifications will take many years to be replaced, particularly in less developed countries, where regulatory measures are currently also less stringent.'

Comments (135)

Share what you think

- Newest
- Oldest
- Best rated
- Worst rated

View all

gypsymoo, wild wales, 2 years ago

I can guite believe this of diesel fums as well as petrol fumes, We live three fields away form the A55 but in the summer and weekends you can smell the cars and lorry fumes in our gardens it the only time, I have to use my Ventalin Inhaler and our nose and eyes are streaming. I am not surprised that the cancer is very high in these areas along the A55 in both for adult and children. As for making fuel from peanuts oil for the past two years all our local farm and pet supplier have had big problems of getting supplies of peanuts due to the Chinese buying up all the worlds peanuts to make bio fuel and two years ago I was paying £26 for a sack of 25 kilos now we are paying £40 for 25 kilos that when I can get some.

1
5

Click to rate

dibble, Newcaslte UK, 2 years ago

Followed a diesel Mercedes today coming from the supermarket. As soon as he accelerated on to the motorway a large blast of black smoke billowed out of the exhaust. Not just a wisp - mind you. It was a mini Hiroshima.

1
3

Click to rate

Old Skool, Leeds, UK, 2 years ago

5

C

Federal Standards for Diesel Engine Noise Emissions

By Brendan Malloney, eHow Contributor

The federal government regulates many aspects of commercial operations, including noise emissions from vehicles. Without federal regulations in place, neighboring communities would be constantly disrupted by loud engine noise. *Have a question? Get an answer from a mechanic now!*

Other People Are Reading


United States Federal Requirements for Diesel Engine Noise Elimination


How to Penny Lock a Door

Trains

Diesel locomotive engines must meet OSHA's noise requirement of 85 decibels. An average of 88 decibels is emitted in a locomotive

1

cab when combining engine noise with braking systems, air horns and alerting systems, according to Internoise.

Highway Vehicles

The Code of Federal Regulations prohibits any diesel engine from emitting greater than 90 decibels while operating over 35 miles per hour, while no greater than 86 decibels is permitted under 35 miles per hour. Noise levels are measured 50 feet from the travel lane, regardless of vehicle loading or road grade.

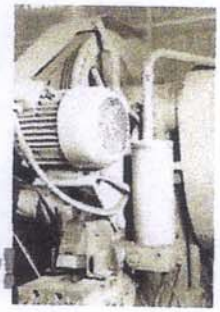
Exceptions

Emergency vehicle engines and their sirens are not required to comply with these federal standards when responding to emergencies. Snow plows are also exempt from federal regulations when required.

United States Federal Requirements for Diesel Engine Noise Elimination

By Michael Staton, eHow Contributor

People associate diesel engines with the passing of a loud truck or the noisy hum of a huge generator. However, federal regulations are growing more stringent when it comes to the noise produced by these diesel engines. For the benefit of drivers, pedestrians and those who work with diesel engines, several federal requirements pertain to diesel engine *noise.* *Have a question? Get an answer from a lawyer now!*



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Federal Standards for Diesel Engine Noise Emissions


Decibel Level Comparison

Truck Regulations

According to International Trucks, diesel engines in large and small trucks are becoming increasingly quieter, almost within the range of regular gasoline engines. Federal law decrees that truck engine noise at high idle be below 90 decibels. Due to high pressure fuel systems that even out combustion noise, Grundman states that diesel engines in trucks are now regularly in the range of 70 decibels.

Train Regulations

Diesel engines in trains are also required to be below a certain decibel range, but the regulations are more for the benefit of the employees that work on them. The Occupational Safety and Health Administration or OSHA maintains rules that keep employees from being exposed to too much noise in the workplace. The maximum amount of noise OSHA deems acceptable in the workplace is 85 decibels. The Federal Railroad Administration amended existing rules on workplace noise in 2006 to reduce workplace noise to below 85 decibels for the safety of employees.

Diesel Generator Regulations

Generators that run on diesel fuel are also regulated for the sake of employees and for people nearby. Pollution Engineering states that

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Bombings Spur Closer Study of Ear Injuries

By Jennifer Levitz

BOSTON—Eric Whalley, a retired biotechnology researcher, is slowly recovering from severe leg wounds he sustained at the 2013 Boston Marathon. He was watching the race when two bombs exploded near the finish line.

One physical reminder, however, is unrelenting: the high-pitched noise in his ears. "The thing that drives me crazy is the constant buzz," said Mr. Whalley, who is 66 years old and lives in Boston. "It's there all the time, day and night."

More than a year after the bombings, charities and researchers are taking note of an increasingly noticeable aftereffect: a large group of civilians with blast-related ear injuries more commonly seen in the military. Problems range from dizziness to reduced hearing to tinnitus—a ringing or buzzing noise in one ear or both.

At the Massachusetts Eye and Ear Infirmary in Boston. "the tinnitus specialist has been inundated with patients," said Daniel Lee, a doctor at the hospital and an associate professor of otology and laryngology at Harvard Medical School.

Dr. Lee and other specialists at the hospital are now following more than 100 bombing survivors in a multiyear study that aims to shed new light on treating severe "acoustic" trauma. "The main concern is, how can we care for them? But our second thought is, how can we learn from this to help patients in the future if, God forbid, this should happen again," said Dr. Lee.

One Fund Boston, the charity for Boston Marathon bombing survivors, plans to establish a collaborative by early fall to treat less-obvious injuries, including hearing loss and tinnitus. The effort, which it estimates will cost $1.6 million, will include hiring more specialists to treat conditions, such as tinnitus, where there haven't been enough doctors to meet demand, a spokeswoman said.

The marathon bombings killed three people and wounded more than 260. Dzhokhar Tsarnaev, who authorities allege carried out the bombings with his now-deceased brother, is scheduled to go on trial in November. The 21-year-old has pleaded not guilty.

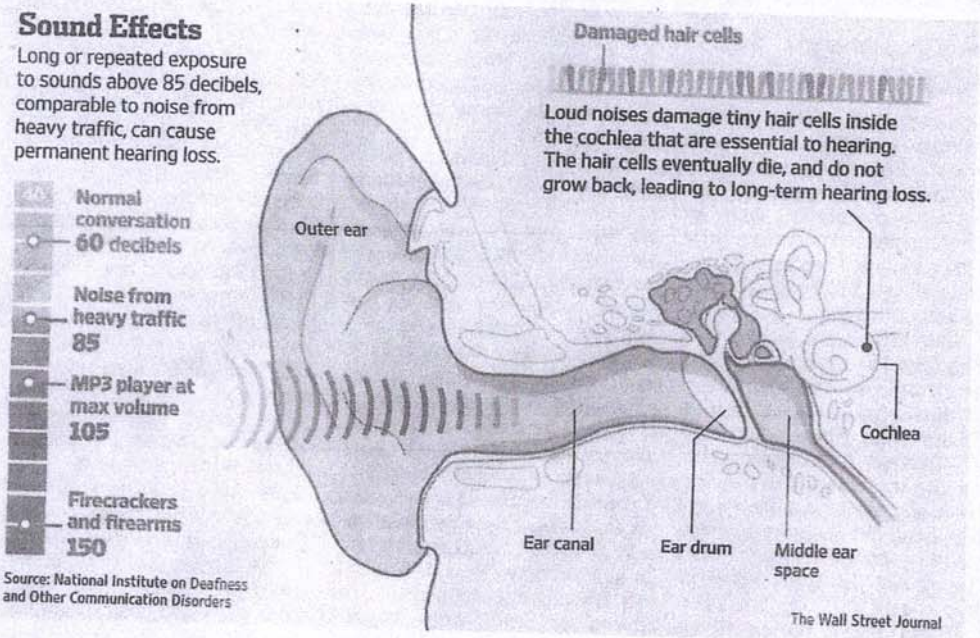
The bombs generated tremendous noise, likely above the level at which ear drums start to rupture, said Philip Littlefield, director of otology and neurotology at Tripler Army Medical Center in Honolulu who has advised Boston doctors on treatment of the marathon survivors.

Scott Weisberg, a doctor in Birmingham, Ala., who ran the Boston Marathon and finished seconds before the first bomb went off, felt disoriented after the blast, he said. When he returned to work, he couldn't hear a patient's heart murmur, which another doctor had pointed out.

Dr. Weisberg, 44, said the concussion he sustained that day and persistent reduced hearing has forced him to work more slowly and see fewer patients. "You go from hearing everything to this world to where you have to struggle," he said.

Researchers at Massachusetts Eye and Ear are tracking several areas, such as the effectiveness of steroids given early on, and whether ruptured ear drums heal on their own or require surgery.

"One of most common questions asked by survivors has been, 'Will the ringing improve? Will my sense of hearing improve as we get further away?' " said Dr. Lee. "The answer is that we don't know for sure what the outcome will be."



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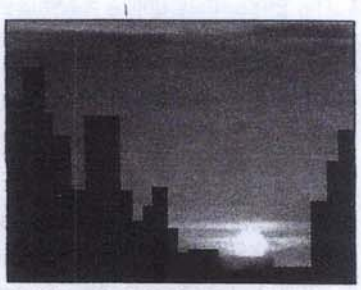

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The Urban Heat Island (UHI) Effect

Definition

Around half of the world's human population lives in urban areas. In the near future it is expected that the global rate of urbanization will increase by 70% of the present world urban population by 2030, as urban agglomerations emerge and population migration from rural to urban/suburban areas continues. Thereby, it is not surprising that the negative impacts related to urbanization is an increasing concern capturing the attention of people worldwide.

Urbanization negatively impacts the environment mainly by the production of pollution, the modification of the physical and chemical properties of the atmosphere, and the covering of the soil surface. Considered to be a cumulative effect of all these impacts is the UHI, defined as the rise in temperature of any man-made area, resulting in a well-defined, distinct "warm island" among the "cool sea" represented by the lower temperature of the area's nearby natural landscape (figure 1). Though heat islands may form on any rural or urban area, and at any spatial scale, cities are favoured, since their surfaces are prone to release large quantities of heat. Nonetheless, the UHI negatively impacts not only residents of urban-related environs, but also humans and their associated ecosystems located far away from cities. In fact, UHIs have been indirectly related to climate change due to their contribution to the greenhouse effect, and therefore, to global warming.

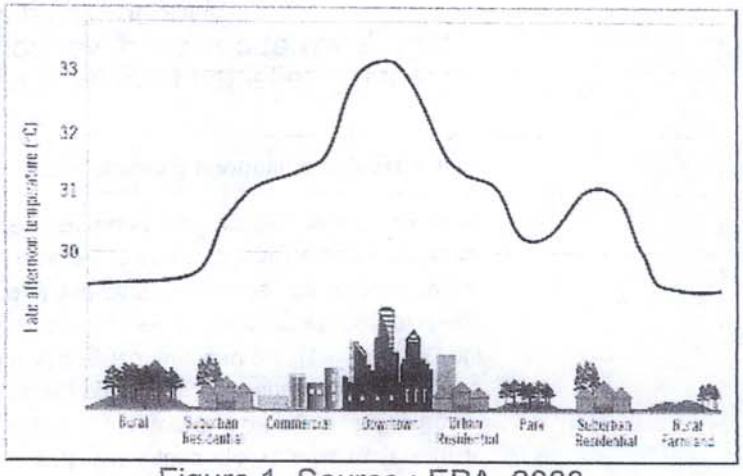


Figure 1. Source : EPA, 2008

Causes

It is well-known that the progressive replacement of natural surfaces by builtsurfaces, through urbanization, constitutes the main cause of UHI formation. Natural surfaces are often

composed of vegetation and moisture-trapping soils. Therefore, they utilize a relatively large proportion of the absorbed radiation in the evapotranspiration process and release water vapour that contributes to cool the air in their vicinity. In contrast, built surfaces are composed of a high percentage of non-reflective and water-resistant construction materials. As consequence, they tend to absorb a significant proportion of the incident radiation, which is released as heat.

Vegetation intercepts radiation and produces shade that also contributes to reduce urban heat release. The decrease and fragmentation of large vegetated areas such as parks, not only reduces these benefits, but also inhibits atmospheric cooling due to horizontal air circulation generated by the temperature gradient between vegetated and urbanized areas (i.e. advection), which is known as the park cool island effect. On the other hand, the narrow arrangement of buildings along the city's streets form urban canyons that inhibit the escape of the reflected radiation from most of the three-dimensional urban surface to space. This radiation is ultimately absorbed by the building walls (i.e. reduced sky view factor), thus enhancing the urban heat release. Additional factors such as the scattered and emitted radiation from atmospheric pollutants to the urban area, the production of waste heat from air conditioning and refrigeration systems, as well from industrial processes and motorized vehicular traffic (i.e. anthropogenic heat), and the obstruction of rural air flows by the windward face of the built-up surfaces, have been recognized as additional causes of the UHI effect.

Vancouver's downtown (source : http://www.aboutvancouver.co.uk). Vertical surfaces absorb the energy reflected from most of the three-dimensional built-up surface.

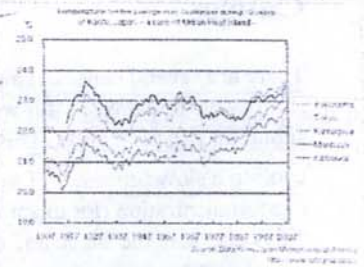
Main spatial and temporal characteristics

In an isothermal map the UHI is represented by closed contours on the urban area, which contrasts with the wider contours of the rural areas. Meanwhile, in a thermal profile the UHI is represented by the isothermic curve rise throughout the urban area, which contrasts with the characteristic low flattened curve of the rural areas. According to the typical thermal profile of the UHI (figure 1), the rural thermal field is interrupted by a steep temperature gradient at the rural/urban boundaries (i.e. cliff), and thereafter a steady but weaker horizontal gradient of increasing temperature (i.e. plateau) is prolonged until reaching the highest temperature point at the urban core or city centre (i.e. peak). The uniformity of this "island" shaped pattern generally indicates a few depressions due to the presence of particularly hot points (i.e. micro urban heat islands) associated with features such as parking lots, malls, industrial facilities, etc, and minor rises due to the presence of particularly cold points (i.e. heat sinks) associated with features such as parks, fields, water bodies, etc. The difference between the warmest urban zone and the base rural temperature defines the intensity or magnitude of the UHI.

Urban heat island

From Wikipedia, the free encyclopedia

An **urban heat island (UHI)** is a metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. The phenomenon was first investigated and described by Luke Howard in the 1810s, although he was not the one to name the phenomenon.[1] The temperature difference usually is larger at night than during the day, and is most apparent when winds are weak. UHI is most noticeable during the summer and winter. The main cause of the urban heat island effect is from the modification of land surfaces, which use materials that effectively store short-wave radiation.[2][3] Waste heat generated by energy usage is a secondary contributor.[4] As a population center grows, it tends to expand its area and increase its average temperature. The less-used term **heat island** refers to any area, populated or not, which is consistently hotter than the surrounding area.[5]



Tokyo, an example of an urban heat island. Normal temperatures of Tokyo go up more than those of the surrounding area.

Monthly rainfall is greater downwind of cities, partially due to the UHI. Increases in heat within urban centers increases the length of growing seasons, and decreases the occurrence of weak tornadoes. The UHI decreases air quality by increasing the production of pollutants such as ozone, and decreases water quality as warmer waters flow into area streams and put stress on their ecosystems.

Not all cities have a distinct urban heat island. Mitigation of the urban heat island effect can be accomplished through the use of green roofs and the use of lighter-colored surfaces in urban areas, which reflect more sunlight and absorb less heat.

Despite concerns raised about its possible contribution to global warming, comparisons between urban and rural areas show that the urban heat island effects have little influence on global mean temperature trends.[6]

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Causes

There are several causes of an urban heat island (UHI). The principal reason for the nighttime warming is that the short-wave radiation is still within the concrete, asphalt, and buildings that was absorbed during the day, unlike suburban and rural areas. This energy is then slowly released during the night as long-wave radiation, making cooling a slow process.[2] Two other reasons are changes in the thermal properties of surface materials and lack of evapotranspiration (for example through lack of vegetation) in urban areas. With a decreased amount of vegetation, cities also lose the shade and cooling effect of trees, the low albedo of their leaves, and the removal of carbon dioxide.[7][8] Materials commonly used in urban areas for pavement and roofs, such as concrete and asphalt, have significantly different thermal bulk properties (including heat capacity and thermal conductivity) and surface radiative properties (albedo and emissivity) than the surrounding rural areas. This causes a change in the energy balance of the urban area, often leading to higher temperatures than surrounding rural areas.[9]

Thermal (top) and vegetation (bottom) locations around New York City via infrared satellite imagery. A comparison of the images shows that where vegetation is dense, temperatures are cooler.

Other causes of a UHI are due to geometric effects. The tall buildings within many urban areas provide multiple surfaces for the reflection and absorption of sunlight, increasing the efficiency with which urban areas are heated. This is called the "urban canyon effect". Another effect of buildings is the blocking of wind, which also inhibits cooling by convection and pollution from dissipating. Waste heat from automobiles, air conditioning, industry, and other sources also contributes to the UHI.[4][10][11] High levels of pollution in urban areas can also increase the UHI, as many forms of pollution change the radiative properties of the atmosphere.[9] As UHI raises the temperature of cities, it will also increase the concentration of ozone in the air, which is a greenhouse gas. Ozone concentrations will increase because it is a secondary gas, aided by an increase in temperature and sunlight.[12]

Some cities exhibit a heat island effect, largest at night. Seasonally, UHI shows up both in summer and winter.[13][14] The typical temperature difference is several degrees between the center of the city and surrounding fields. The difference in temperature between an inner city and its surrounding suburbs is frequently mentioned in weather reports, as in "68 °F (20 °C) downtown, 64 °F (18 °C) in the suburbs". Black surfaces absorb significantly more electromagnetic radiation, and causes the surfaces of asphalt roads and highways to heat.[15] "The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4 °F (1.0–3.0 °C) warmer than its surroundings. In the evening, the difference can be as high as 22 °F (12 °C).[16]"

Diurnal behavior

The IPCC stated that "it is well-known that compared to non-urban areas urban heat islands raise night-time temperatures more than daytime temperatures."[17] For example, Barcelona, Spain is 0.2 °C (0.4 °F) cooler for daily maxima and 2.9 °C (5.2 °F) warmer for minima than a nearby rural station.[18] A description of the very first report of the UHI by Luke Howard in the late 1810s said that the urban center of London was warmer at night than the surrounding countryside by 3.7 °F (2.1 °C).[19] Though the warmer air temperature within the UHI is generally most apparent at night, urban heat islands exhibit significant and somewhat paradoxical diurnal behavior. The air temperature difference between the UHI and the surrounding environment is large at night and small during the day. The opposite is true for skin temperatures of the urban landscape within the UHI.[20]

Throughout the daytime, particularly when the skies are free of clouds, urban surfaces are warmed by the absorption of solar radiation. Surfaces in the urban areas tend to warm faster than those of the surrounding rural areas. By virtue of their high heat capacities, urban surfaces act as a giant reservoir of heat energy. For example, concrete can hold roughly 2,000 times as much heat as an equivalent volume of air. As a result, the large daytime surface temperature within the UHI is easily seen via thermal remote sensing.[21] As is often the case with daytime heating, this warming also has the effect of generating convective winds within the urban boundary layer. It is theorized that, due to the atmospheric mixing that results, the air temperature perturbation within the UHI is generally minimal or nonexistent during the day, though the surface temperatures can reach extremely high levels.[22]

At night, the situation reverses. The absence of solar heating causes the atmospheric convection to decrease, and the urban boundary layer begins to stabilize. If enough stabilization occurs, an inversion layer is formed. This traps urban air near the surface, and keeping surface air warm from the still-warm urban surfaces, forming the nighttime warmer air temperatures within the UHI. Other than the heat retention properties of urban areas, the nighttime maximum in urban canyons could also be due to the blocking of "sky view" during cooling: surfaces lose heat at night principally by radiation to the comparatively cool sky, and this is blocked by the buildings in an urban area. Radiative cooling is more dominant when wind speed is low and the sky is cloudless, and indeed the UHI is found to be largest at night in these conditions.[23]

Predicting the UHI

If a city or town has a good system of taking weather observations the UHI can be measured directly. An alternative is to use a complex simulation of the location to calculate the UHI, or to use an approximate empirical method[24] Such models than allow the UHI to be included in estimates of future temperatures rises within cities due to climate change.

Professor Leonard O. Myrup, University of California at Davis, developed and published in 1969 the first comprehensive numerical treatment to predict the effects of the urban heat island (UHI). His paper published in the American Meteorological Society's Journal of Applied Meteorology surveys UHI and criticizes then-existing theories as being excessively qualitative. A general purpose, numerical energy budget model is described and applied to the urban atmosphere. Calculations for several special cases as well as a sensitivity analysis are presented. The model is found to predict the correct order of magnitude of the urban temperature excess. The heat island effect is found to be the net result of several competing physical processes. In general, reduced evaporation in the city center and the thermal properties of the city building and paving materials are the dominant parameters. It is suggested that such a model could be used in engineering calculations to improve the climate of existing and future cities.[25]

Impact on animals

Ant colonies in urban heat islands have an increased heat tolerance at no cost to cold tolerance.[26]

Other impacts on weather and climate

Aside from the effect on temperature, UHIs can produce secondary effects on local meteorology, including the altering of local wind patterns, the development of clouds and fog, the humidity, and the rates of precipitation.[27] The extra heat provided by the UHI leads to greater upward motion, which can induce additional shower and thunderstorm activity. In addition, the UHI creates during the day a local low pressure area where relatively moist air from its rural surroundings converges, possibly leading to more favorable conditions for cloud formation.[28] Rainfall rates downwind of cities are increased between 48% and 116%. Partly as a result of this warming, monthly rainfall is about 28% greater between 20 miles (32 km) to 40 miles (64 km) downwind of cities, compared with upwind.[29] Some cities show a total precipitation increase of 51%.[30]

Research has been done in a few areas suggesting that metropolitan areas are less susceptible to weak tornadoes due to the turbulent mixing caused by the warmth of the urban heat island.[31] Using satellite images, researchers discovered that city climates have a noticeable influence on plant growing seasons up to 10 kilometers (6.2 miles) away from a city's edges. Growing seasons in 70 cities in eastern North America were about 15 days longer in urban areas compared to rural areas outside of a city's influence.[32]

Health effects

UHIs have the potential to directly influence the health and welfare of urban residents. Within the United States alone, an average of 1,000 people die each year due to extreme heat.[33] As UHIs are characterized by increased temperature, they can potentially increase the magnitude and duration of heat waves within cities. Research has found that the mortality rate during a heat wave increases exponentially with the maximum temperature,[34] an effect that is exacerbated by the UHI. The nighttime effect of UHIs can be particularly harmful during a heat wave, as it deprives urban residents of the cool relief found in rural areas during the night.[35]

Image of Atlanta, Georgia, showing temperature distribution, with blue showing cool temperatures, red warm, and hot areas appear white.

Research in the United States suggests that the relationship between extreme temperature and mortality varies by location. Heat is more likely to increase the risk of mortality in cities at mid-latitudes and high latitudes with significant annual temperature variation. For example, when Chicago and New York experience unusually hot summertime temperatures, elevated levels of illness and death are predicted. In contrast, parts of the country that are mild to hot year-round have a lower public health risk from excessive heat. Research shows that residents of southern cities, such as Los Angeles, Phoenix, and Miami, tend to be acclimated to hot weather conditions and therefore less vulnerable to heat related deaths.[36]

Increased temperatures have been reported to cause heat stroke, heat exhaustion, heat syncope, and heat cramps.[37] Some studies have also looked at how severe heat stroke can lead to permanent damage to organ systems.[37] This damage can increase the risk of early mortality because the damage can cause severe impairment in organ function.[37] Other complications of heat stroke include respiratory distress syndrome in adults and disseminated intravascular coagulation.[38] Some researchers have noted that any compromise to the human body's ability to thermoregulate would in theory increase risk of mortality.[37] This includes illnesses that may affect a person's mobility, awareness, or behavior.[37] Researchers[38] have noted that individuals with cognitive health issues (e.g. depression, dementia, Parkinson's disease) are more at risk when faced with high temperatures and "need to take extra care"[37] as cognitive performance has been shown to be differentially affected[39] by heat. People with

diabetes,[37] are overweight,[38] have sleep deprivation,[38] or have cardiovascular/cerebrovascular conditions should avoid too much heat exposure.[37][38] Some common medications that have an effect on thermoregulation can also increase the risk of mortality. Specific examples include anticholinergics,[37] diuretics,[37] phenotiazines[38] and barbiturates.[38] Not only health, but heat can also affect behavior. A U.S. study suggests that heat can make people more irritable and aggressive, noting that violent crimes increased by 4.58 out of 100,000 for every one degree increase in temperature.[40]

A researcher found that high UHI intensity correlates with increased concentrations of air pollutants that gathered at night, which can affect the next day's air quality.[40] These pollutants include volatile organic compounds, carbon monoxide, nitrogen oxides, and particulate matter.[38] The production of these pollutants combined with the higher temperatures in UHIs can quicken the production of ozone.[40] Ozone at surface level is considered to be a harmful pollutant.[40] Studies suggest that increased temperatures in UHIs can increase polluted days but also note that other factors (e.g. air pressure, cloud cover, wind speed) can also have an effect on pollution.[40]

The Centers for Disease Control and Prevention notes that it "is difficult to make valid projections of heat-related illness and death under varying climate change scenarios" and that "heat–related deaths are preventable, as evidenced by the decline of all-cause mortality during heat events over the past 35 years".[41] However, some studies suggest the possibility that health impacts from UHIs are disproportionate because the impacts can be unevenly distributed based on a variety of factors (e.g. age,[38][42] ethnicity and socioeconomic status[43]). This raises the possibility of health impacts from UHIs being an environmental justice issue.

Inequality of tree canopy cover

Relationship between neighborhood income and tree canopy cover

In recent years, researchers have discovered a strong correlation between neighborhood income and tree canopy cover. In 2010, researchers at Auburn University and University of Southern California found that the presence of trees are "highly responsive to changes in [neighborhood] income."[44] Low-income neighborhoods tend to have significantly less trees than neighborhoods with higher incomes. They described this unequal distribution of trees as a demand for "luxury," rather than "necessity."[45] According to the study, "for every 1 percent increase in per capita income, demand for forest cover increased by 1.76 percent. But when income dropped by the same amount, demand decreased by 1.26 percent."[45]

Trees are a necessary feature in combating the urban heat island effect because they reduce air temperatures by 10 degrees,[46] and surface temperatures by up to 20-45 degrees.[47] Researchers hypothesized that less well off neighborhoods do not have the financial resources to plant and maintain trees. Wealthy neighborhoods can afford more trees, on "both public and private property."[48]

Additionally, many blogging sites overlay satellite imagery provided by google maps and census data to confirm or debunk the aforementioned research.[49]

Relationship between race and tree canopy cover

In 2013, researchers from the University of California, Berkeley published a study regarding the racial distribution of "heat risk-related land cover."[50] They found that "blacks were 52 percent more likely than whites to live [in a neighborhood with poor tree cover] in such neighborhoods, Asians 32 percent more likely, and Hispanics 21 percent more likely."[50] Bill Jesdale, from the Department of Environmental Science, Policy and Management at University of California, Berkeley, and one of the study's authors, explained that there is "less shared investment" in "racial stratified" communities, which "shows up in the trees [inequality phenomenon]."[51] According to Jesdale, "segregated places may be less likely to make collective investments, and collective investments are precisely what's needed to support environmental improvements for everyone like planting more trees."[51]

Minorities are much more likely to live in communities with greater exposure to traffic, pollution and other environmental hazards.[52] As a result, they are at much higher risk to heat related health problems associated with urban heat islands and climate change. However, research points out that in racially integrated metropolitan areas, whites are

Impact on nearby water bodies

UHIs also impair water quality. Hot pavement and rooftop surfaces transfer their excess heat to stormwater, which then drains into storm sewers and raises water temperatures as it is released into streams, rivers, ponds, and lakes. Additionally, increased urban water body temperatures lead to a decrease in diversity in the water.[53] In August 2001, rains over Cedar Rapids, Iowa led to a 10.5C (18.9F) rise in the nearby stream within one hour, which led to a fish kill. Since the temperature of the rain was comparatively cool, it could be attributed to the hot pavement of the city.

6

Similar events have been documented across the American Midwest, as well as Oregon and California.[54] Rapid temperature changes can be stressful to aquatic ecosystems.[55] Permeable pavements may mitigate these effects by percolating water through the pavement into subsurface storage areas where it can be dissipate through absorption and evaporation.[56]

Impact on energy usage

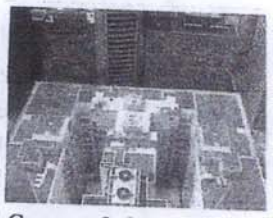
Another consequence of urban heat islands is the increased energy required for air conditioning and refrigeration in cities that are in comparatively hot climates. The Heat Island Group estimates that the heat island effect costs Los Angeles about US$100 million per year in energy.[57] Conversely, those that are in cold climates such as Moscow, Russia would have less demand for heating. However, through the implementation of heat island reduction strategies, significant annual net energy savings have been calculated for northern locations such as Chicago, Salt Lake City, and Toronto.[58]

Images of Salt Lake City, Utal show positive correlation between white reflective roofs and cooler temperatures. Imag A depicts an aerial view of Sal Lake City, Utah, site of 865,000-square-foot (80,400 m^2) white reflective roof. Image B is a thermal infrared image of same area, showing hot (red and yellow) and cool (green and blue) spots The reflective vinyl roof, not absorbing solar radiation, is shown in blue surrounded by other hot spots.

Mitigation

The temperature difference between urban areas and the surrounding suburban or rural areas can be as much as 5 °C (9.0 °F). Nearly 40 percent of that increase is due to the prevalence of dark roofs, with the remainder coming from dark-colored pavement and the declining presence of vegetation. The heat island effect can be counteracted slightly by using white or reflective materials to build houses, roofs, pavements, and roads, thus increasing the overall albedo of the city. Relative to remedying the other sources of the problem, replacing dark roofing requires the least amount of investment for the most immediate return. A cool roof made from a reflective material such as vinyl reflects at least 75 percent of the sun's rays, and emit at least 70 percent of the solar radiation absorbed by the building envelope. Asphalt built-up roofs (BUR), by comparison, reflect 6 percent to 26 percent of solar radiation.[59]

Using light-colored concrete has proven effective in reflecting up to 50% more light than asphalt and reducing ambient temperature.[56] A low albedo value, characteristic of black asphalt, absorbs a large percentage of solar heat creating warmer near-surface temperatures. Paving with light-colored concrete, in addition to replacing asphalt with light-colored concrete, communities may be able to lower average temperatures.[60] However, research into the interaction between reflective pavements and buildings has found that, unless the nearby buildings are fitted with reflective glass, solar radiation reflected off light-colored pavements can increase building temperatures, increasing air conditioning demands.[61][62]



Green roof of City Hall in Chicago, Illinois.

A second option is to increase the amount of well-watered vegetation. These two options can be combined with the implementation of green roofs. Green roofs are excellent insulators during the warm weather months and the plants cool the surrounding environment. Air quality is improved as the plants absorb carbon dioxide with concomitant production of oxygen.[63] The city of New York determined that the cooling potential per area was highest for street trees, followed by living roofs, light covered surface, and open space planting. From the standpoint of cost effectiveness, light surfaces, light roofs, and curbside planting have lower costs per temperature reduction.[64]

A hypothetical "cool communities" program in Los Angeles has projected that urban temperatures could be reduced by approximately 3 °C (5 °F) after planting ten million trees, reroofing five million homes, and painting one-quarter of the roads at an estimated cost of US$1 billion, giving estimated annual benefits of US$170 million from reduced air-conditioning costs and US$360 million in smog related health savings.[65]

Mitigation of urban heat islands

- **White roofs**: Painting rooftops white has become a common strategy to reduce the heat island effect.[66] In cities, there are many dark colored surfaces that absorb the heat of the sun in turn lowering the albedo of the city.[66] White rooftops allows high solar reflectance and high solar emittance, increasing the albedo of the city or area the effect is occurring.[66]
- **Green roofs**: Green roofs are another method of decreasing the urban heat island effect. Green roofery is the practice of having vegetation on a roof; such as having trees or a garden. The plants that are on the roof increase the albedo and decreases the urban heat island effect.[66] This method has been studied and criticized for the fact that green roofs are affected by climatic conditions of green roof variables are hard to measure, and are very complex systems [66]

- **Planting trees in cities:** Planting trees around the city can be another way of increasing albedo and decreasing the urban heat island effect. Trees absorb carbon dioxide and provide shade. It is recommended to plant deciduous trees because they can provide many benefits such as more shade in the summer and not blocking warmth of winter [67]

Mitigation policies, measures and other strategies

AB32 scoping plan

AB32 required the California Air Resources Board to create a scoping plan. This plan is California's approach on how to carry out their goal of combatting climate change by reducing greenhouse emissions by 2020 to levels from the 1990s. The scoping plan had four primary programs, advanced clean cars, cap and trade, renewables portfolio standard and low carbon fuel standard all geared toward increased energy efficiency. The plan has main strategies to reduce green house gases such as having monetary incentives, regulations and voluntary actions. Every five years the scoping plan is updated.[68]

- **The advanced clean car rules program** was made to reduce tail pipe emissions. The Air Resources Board approved the program to control emissions for newer models from the year 2017 to 2025. Some of their goals by 2025 are to have more environmentally superior cars to be available in different models and different types of cars. New automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions. And if fully implemented consumers can save an average of $6,000 over the life of the car.[69]
- **The renewable portfolio standard** mandates to increase renewable energy from a variety of sources such as solar power and wind. Investor-owned utilities, community choice aggregators and electric service providers are required to increase procurement to 33% by 2020.[70]
- **Low carbon fuel standards** is administered by the California Air Resources Board and attempts to make wider choice of cleaner fuels to Californians. Producers of petroleum-based fuels are required to reduce the carbon intensity of their products to 10 percent in 2020.[71]
- **Cap and trade** is designed to reduce the effects of climate change by setting a cap on greenhouse gases released into the atmosphere. The cap will decline approximately three percent each year in 2013. The trading will create incentives to reduce the effects of climate change in California communities by reducing greenhouse gases through investments in clean technologies.[72]

Clean Air Act

The EPA has initiated several air quality requirements that help reduce ground-level ozone that leads to urban heat islands. In the Clean Air Act, one of the EPA's chief policies, there are certain regulations that are put in place to ensure the state's emissions stay below a certain level. Included in the Clean Air Act, all states must set forth an State Implementation Plan (SIP) which is designed to guarantee all states meet a central air quality standard.[73]

State implementation plans and policies

- **The Emerging and Voluntary Measures Policy** allows a state to add unconventional forms of heat island mitigation. This can include removing pollution after it has already been emitted into air, water, or soil. These measures are not implemented into law, but they do make it possible for certain parties to voluntarily become more efficient. The purpose of this policy is for all polluting sources to follow by example and use the most successful forms of mitigation.[74]
- **The Guidance on State Implementation Plan Credits for Emissions Reductions from Electric-Sector Energy Efficiency or Renewable Energy Measures** is an educational tool for states to create an up to date and well-organized SIP. It allows states to include plans that meet the guidelines or plans that exceed expectations. Based on the success of their SIP, some states can have their plans incorporated into other SIPs. [75]
- **The Bundled Measures Policy** authorizes different factions within the state to collaborate on mitigation projects. This policy takes a more of a community-based approach by adding several groups for the purpose of multiple perspectives and inventive approaches. The Bundled Measures Policy is one method that generates co-benefits for both parties.[76] In example, if a partaking business were to add cool roofs, there will be a reduction in greenhouse gases which is beneficial for the environment as well as the need for excess energy which is beneficial for the business.

Implementation of policies

The Seattle Green Factor, a multifaceted system for urban landscaping, has seen much success in the mitigation of urban heat islands. The program focuses on areas that are prone to high pollution, such as business districts. There are strict guidelines for any new construction that exceeds roughly 20 parking spaces, and this platform helps developers physically see their levels of pollution while trying different methods of construction to figure out the most effective course of action. Seattle has correspondingly produced a "score sheet" for cities to use in their city planning.[77]

AB32 and urban heat islands

- Urban heat islands increase demand for energy consumption during the summer when temperatures rise. As a result of increased energy consumption, there is an increase in air pollution and greenhouse gas emissions. This policy focuses on lowering greenhouse emissions, whicl contributes to lowering the heat island effect.[78]

EPA Compendium of Strategies

This compendium focuses on a variety of issues dealing with urban heat islands. They describe how urban heat islands are created, who is affected and how people can make a difference to reduce temperature. It also shows examples of policies and voluntary actions by state and local governments to reduce the effect of urban heat islands[79]

Incentives

- **Sacramento Municipal Utility District** (SMUD) and the Sacramento Tree Foundation have partnered to provide the city of Sacramento shad trees for free. The program allows citizens to receive trees from four to seven feet tall. They also give them fertilizer, and delivery, all at no cost. They encourage citizens to plant their trees to benefit their home by reducing air conditioning costs. Approximately more than 450,000 shade trees have been planted in the Sacramento area.[80]
- **The Eco-Roof Incentive Program**: In Canada, grants are distributed throughout Toronto for installing green and cool roofs on residential and commercial buildings. This will reduce usage of energy and lower green house gas emissions.[81]
- **Tree vitalize**: This program is a partnership with multiple entities that focuses on helping restore tree cover in the city, it also educates citizens about the positive effects of trees on climate change and the urban heat island effect. And another goal they have is to build capacity among local governments to understand, protect and restore their urban trees. Because there is a need for educating citizens about the maintenance of trees, Treevitalize provides nine hours of classroom and field training to community residents. The classes cover a variety of topics such as tree identification, pruning, tree biology, and proper species selection.[82]

Weatherization

U.S. Department of Energy Weatherization Assistance Program helps low income recipients by covering their heating bills and helping the families to make their homes energy efficient. In addition, this program allows states to also use the funds to install cooling efficiency measures such as shading devices.[82]

Outreach and education

- **Tree Utah**: a statewide non-profit organization is dedicated to educating communities about the environmental and social benefits provided by trees. They are also committed to planting thousands of trees throughout the state of Utah.[83]
- The Lawrence Hall of Science at UC Berkeley has a high-school level course called Global Systems Science. The course focuses on a variety of topics including climate change and the greenhouse effect.[84]

Tree protection ordinances

- A variety of local governments have implemented tree and landscape ordinances, which will help communities by providing shade during summer. Tree protection is an ordinance that does not allow someone to prune or remove trees without a city permit. An example is the city of Glendale, California: Through the Indigenous Tree Ordinance, the city of Glendale protects the following species of trees, the California sycamore, the coast live oak, mesa oak, valley oak, scrub oak, California bay. Anyone who is planning on removing or trimming the trees has to obtain an indigenous tree permit. Within the permit they have to provide detailed information about the number of trees affected, trunk diameter and the health of the tree itself. They also have to submit photographs of the site, and a site plan sketch.[85]
- Another example is the city of Berkeley, California. The tree protection ordinance prohibits the removal of coast live oak trees and any excessive pruning that can cause harm to the tree is also prohibited. The only exception is if the tree is poses a danger to life or limb and danger to the property.[86]

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- The city of Visalia, California has implemented a street tree ordinance intended to promote and regulate the planting, maintenance, and protection of street trees within the city. Their ordinance does not allow street trees to be altered, pruned or removed. Street trees are also protected during construction.[87]

Co-benefits of mitigation strategies

Trees and gardens aid mental health

- A large percentage of people who live in urban areas have access to parks and gardens in their areas, which are probably the only connections they have with nature. A study shows that having contact with nature helps promote our health and well-being. People who had access to gardens or parks were found to be healthier than those who did not.[88]
- Another study done investigating whether or not the viewing of natural scenery may influence the recoveries of people from undergoing surgeries, found that people who had a window with a scenic view the had shorter post operative hospital stays and less negative comments from nurses.[89]

Tree planting as empowerment and community building

- Los Angeles TreePeople, is an example of how tree planting can empower a community. Tree people provides the opportunity for people to come together, build capacity, community pride and the opportunity to collaborate and network with each other.[90]

Green roofs as food production

- Growing food on rooftops could be an option for fast growing communities. Popular plants grown for food include, chives, oregano and lavender these plants are suitable for green roofs because they are evolutionarily equipped for Mediterranean climate.[91]

Green roofs and wild life biodiversity

- Green roofs are important for wildlife because they allow organisms to inhabit the new garden. To maximize opportunities to attract wildlife to a green roof, one must aid the garden to be as diverse as possible in the plants that are added. By planting a wide array of plants, different kinds of invertebrate species will be able to colonize, they will be provided with foraging sources and habitat opportunities.[91]

Urban forests and a cleaner atmosphere

- Trees provide benefits such as absorbing carbon dioxide, and other pollutants.[92] Trees also provide shade and reduce ozone emissions from vehicles. By having many trees, we can cool the city heat by approximately 10 degrees to 20 degrees, which will help reducing ozone and helping communities that are mostly affected by the effects of climate change and urban heat islands.[93]

Green building programs

Voluntary green building programs have been promoting the mitigation of the heat island effect for years.[94] For example, one of the ways for a site to earn points under the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System is to take action that reduces heat islands, minimizing impacts on microclimates and human and wildlife habitats. Credits associated with reflective roofing or planted roofs can help a building achieve LEED certification. Buildings also receive credits by providing shade.[95] Similarly, The Green Building Initiative (http://www.thegbi.org/) (GBI)'s Green Globes program awards points to sites that take measures to decrease a building's energy consumption and reduce the heat island effect. As many as 10 points may be awarded to sites with roof coverage from vegetation, highly reflective materials, or a combination of the two.[96]

Cost analysis

Every year in the U.S. 15% of energy goes towards the air conditioning of buildings in these urban heat islands. According to Rosenfeld et. al., "the air conditioning demand has risen 10% within the last 40 years."[97] Home and business owners alike can benefit from building a cool community. A decrease in energy usage directly correlates to cost efficiency. Areas with substantial vegetation and reflective surface materials used for roofs of houses, pavement, and roads are proven to be more effective and cost efficient.

10

In a case study of the Los Angeles Basin, simulations showed that even when trees are not strategically placed in these urban heat islands, they still aid in minimization of pollutants and energy reduction. It is estimated that with this wide-scale implementation, the city of Los Angeles can annually save $100M with most of the savings coming from cool roofs, lighter colored pavement, and the planting of trees. With a city-wide implementation, added benefits from the lowering smog-level would result in at least one billion dollars of saving per year.[97]

The cost efficiency of green roofs is quite high because of several reasons. According to Carter, "A conventional roof is estimated to be $83.78/m while a green roof was estimated at $158.82/m^2.[98] For one, green roofs have over double the lifespan of a conventional roof, effectively decelerating the amount of roof replacements every year. In addition to roof-life, green roofs add stormwater management reducing fees for utilities. The cost for green roofs cost more in the beginning but over a period of time, it's efficiency provides financial, as well as health benefit

In Capital E Analysis' conclusions of the financial benefits of green buildings, it was determined that green roofs successfully lowered energy usage and raised health benefits. For every square foot of green roof used in one study the savings amounted to $5.80 energy-wise. There were a savings seen in the emissions, water, and maintenance categories. Overall, the savings amounted to $52.90-$71.30 on average while the cost of going green totaled -$3.00-$5.00.[99]

Global warming

Because some parts of some cities may be hotter than their surroundings, concerns have been raised that the effects of urban sprawl might be misinterpreted as an increase in global temperature. Such effects are removed by homogenization from the raw climate record by comparing urba stations with surrounding stations. While the "heat island" warming is an important local effect, there is no evidence that it biases *trends* in the homogenized historical temperature record. For example, urban and rural trends are very similar.[17]

The Third Assessment Report from the IPCC says:

> However, over the Northern Hemisphere land areas where urban heat islands are most apparent, both the trends of lower-tropospheric temperature and surface air temperature show no significant differences. In fact, the lower-tropospheric temperatures warm at a slightly greater rate over North America (about 0.28°C/decade using satellite data) than do the surface temperatures (0.27°C/decade), although again the difference is not statistically significant.[17]

Ground temperature measurements, like most weather observations, are logged by location. Their siting predates the massive sprawl, roadbuilding programs, and high- and medium-rise expansions which contribute to the UHI. More importantly, station logs allow sites in question to be filtered easily from data sets. Doing so, the presence of heat islands is visible, but overall trends change in magnitude, not direction. The effects of the urban heat island may be overstated. One study stated, "Contrary to generally accepted wisdom, no statistically significant impact of urbanization could be found in annual temperatures." This was done by using satellite-based night-light detection of urban areas, and more thorough homogenisation of the time series (with corrections, for example, for the tendency of surrounding rural stations to be slightly higher in elevation, and thus cooler, than urban areas). If its conclusion is accepted, then it is necessary to "unravel the mystery of how a global temperature time series created partly from urban in situ stations could show no contamination from urban warming." The main conclusion is that microscale and local-scale impacts dominate the mesoscale impact of the urban heat island. Many sections of towns may be warmer than rural sites, but surface weather observations are likely to be made in park "cool islands."[100]

Not all cities show a warming relative to their rural surroundings. After trends were adjusted in urban weather stations around the world to match rural stations in their regions, in an effort to homogenise the temperature record, in 42 percent of cases, cities were getting *cooler* relative to their surroundings rather than warmer. One reason is that urban areas are heterogeneous, and weather stations are often sited in "cool islands" – parks, for example – within urban areas.[101]

Studies in 2004 and 2006 attempted to test the urban heat island theory, by comparing temperature readings taken on calm nights with those taken on windy nights.[102][103] If the urban heat island theory is correct then instruments should have recorded a bigger temperature rise for calm nights than for windy ones, because wind blows excess heat away from cities and away from the measuring instruments. There was no difference between the calm and windy nights, and one study said that "we show that, globally, temperatures over land have risen as much on windy nights as on calm nights, indicating that the observed overall warming is not a consequence of urban development."[102][104]

A view often held by those who reject the evidence for global warming is that much of the temperature increase seen in land based thermometers could be due to an increase in urbanization and the siting of measurement stations in urban areas.[104] For example, Ross McKitrick and Patrick J. Michaels conducted a statistical study of surface-temperature data regressed against socioeconomic indicators, and concluded that about half of the observed warming trend (for 1979–2002) could be accounted for by the residual UHI effects in the corrected temperature data set they studied—which had already been processed to remove the (modeled) UHI contribution.[105][106] Critics of this paper, including Gavin A. Schmidt, [107] have said the results can be explained away as an artifact of spatial autocorrelation. McKittrick and Nicolas Nierenberg stated further that "the evidence for contamination of climatic data is robust across numerous data sets."[108]

The preliminary results of an independent assessment carried out by the Berkeley Earth Surface Temperature group, and made available to the public in October 2011, found that among other scientific concerns raised by skeptics, the urban heat island effect did not bias the results obtained by NOAA, the Hadley Centre and NASA's GISS. The Berkeley Earth group also confirmed that over the past 50 years the land surface warmed by 0.911 °C, and their results closely matched those obtained from earlier studies.[109][110][111][112][113]

Climate Change 2007, the Fourth Assessment Report from the IPCC states the following.

> Studies that have looked at hemispheric and global scales conclude that any urban-related trend is an order of magnitude smaller than decadal and longer time-scale trends evident in the series (e.g., Jones et al., 1990; Peterson et al., 1999). This result could partly be attributed to the omission from the gridded data set of a small number of sites (<1%) with clear urban-related warming trends. In a worldwide set of about 270 stations, Parker (2004, 2006) noted that warming trends in night minimum temperatures over the period 1950 to 2000 were not enhanced on calm nights, which would be the time most likely to be affected by urban warming. Thus, the global land warming trend discussed is very unlikely to be influenced significantly by increasing urbanisation (Parker, 2006). ... Accordingly, this assessment adds the same level of urban warming uncertainty as in the TAR: 0.006°C per decade since 1900 for land, and 0.002°C per decade since 1900 for blended land with ocean, as ocean UHI is zero.[114]

A 2014 study published in the Proceedings of the National Academy of Sciences of the United States of America looks at the potential of large-scale urban adaptation to counteract the effects of long-term global climate change. The researchers calculate that without any adaptive urban design, by 2100 the expansion of existing U.S. cities into regional megalopolises could raise near-surface temperatures between 1 and 2 degrees Celsius over large regions, "a significant fraction of the 21st-century greenhouse gas-induced climate change simulated by global climate models." Large-scale adaptive design could completely offset this increase, however. For example, the temperature increase in California was calculated to be as high as 1.31 degrees Celsius, but a 100% deployment of "cool roofs" would result in a temperature drop of 1.47 degrees Celsius — more than the increase.[115][116]

See also

- Anthropogenic heat
- Cool roof
- David Parker (climatologist)
- Urban climatology
- Urban dust dome
- Urban reforestation
- Urban thermal plume

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#14

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2010

MEMORANDUM **Planning Division – CC Memo No. 14-083**

DATE: AUGUST 14, 2014

TO: MAYOR AND COUNCIL

THRU: RICH DLUGAS, CITY MANAGER RD
MARSHA REED, ASSISTANT CITY MANAGER MR
JEFF KURTZ, PLANNING ADMINISTRATOR JK
KEVIN MAYO, PLANNING MANAGER KM

FROM: SUSAN FIALA, CITY PLANNER SF

SUBJECT: PDP14-0007 INTEL OCOTILLO CAMPUS AMENDMENT NO. 4

Request: Preliminary Development Plan approval for a Master Plan amendment on the approximate 630-acre parcel

Location: 4500 S. Dobson Road, the northwest corner of Dobson Road and the Chandler Heights Road Alignment

Applicant: Doug Lenz, Intel Corporation

RECOMMENDATION

Planning Commission and Planning Staff, upon finding the request to be consistent with the General Plan, recommend approval subject to conditions.

BACKGROUND

Intel Ocotillo Campus is bounded by Sun Lakes on the south, which is also the extended alignment of Chandler Heights Road. The west side is the extension of the Price Road alignment and common border of the Gila River Indian Community. The east side is bordered by Dobson Road, which is also adjacent to the Ocotillo master planned neighborhood.

The site was zoned as Planned Area Development (PAD) with a Preliminary Development Plan (PDP) in 1993. The Intel Ocotillo Campus PDP has been amended three times prior to the subject request. Each amendment contained a revised site plan to illustrate newly constructed buildings and future facilities. Amendment No. 4 incorporates an update to the master plan on facilities built since Amendment No. 3 and provides a projection of remaining future site development with associated facilities. The long-term phased build-out framework is described in detail in the Development Booklet. Future phases could include expansion of the Fab 42 Manufacturing facility, offices, warehouses, a water treatment and recovery facility (WATR),

and site yard facilities. Future development will be based on market demands, the economy, and user needs. Planning Staff will review each phase administratively for substantial conformance with the PDP.

SITE AND ARCHITECTURE DESIGN

Future development proposes to continue locating buildings and facilities as a series of concentric rings to create a succession of intensity of land use and building massing. Less intense uses, such as parking lots and offices, exist around the perimeter of the site and could be built in future phases. Building setbacks are 50 feet from arterials and 30 feet from collectors. Intel self-imposed a 1,000 foot wide manufacturing building setback along the east and south property lines to further distance these intensive uses from residential developments.

The PAD zoning established the ability for building heights to exceed 45 feet. Building heights within the Ocotillo Campus depend on the structure's use. Office and general purpose buildings would not exceed a 65 feet in height. The WATR facility, proposed in the northwest corner off the campus, could reach a maximum of 55 feet in height except for the brine concentrator equipment and access tower (if required) could reach 80 feet in height. Manufacturing buildings could reach a height of 145 feet. Additional information is contained in the Development Booklet.

Architectural design character is classified under two categories, public/residential buildings and manufacturing/manufacturing support buildings. Public/residential buildings would be constructed of decorative concrete masonry with curtain wall glass and additional materials on office buildings. Manufacturing/manufacturing support buildings typically have approximately the first 20 feet of the elevation constructed of decorative concrete masonry with the remaining upper portion of deep-ribbed colored metal panels. In common to all campus buildings, steel canopies and a color palette carry on the existing theme.

TRAFFIC

A Traffic Assessment was completed to determine potential traffic impacts of the long-term build-out of the Intel Ocotillo Campus. Conclusions indicated level of service for each driveway intersection with Dobson Road. Current operation is acceptable with the permanent and temporary traffic signals at the four driveways. Driveway upgrades would be made to allow for additional turning movements, signal timing, and enhanced landscaping. At the time of future building construction, improvements will be evaluated to address future traffic impacts.

DISCUSSION

Planning Staff supports Amendment No. 4 to the Intel Ocotillo Campus master plan. The proposed future phased development and facilities continue the creation of a cohesively designed campus accompanied by design standards with consideration given to established residential developments. The site will continue to develop in a manner consistent with the General Plan and as a premier employer along the South Price Road Employment Corridor.

PUBLIC / NEIGHBORHOOD NOTIFICATION

- This request was noticed according to the provisions of the City of Chandler Zoning Code.

- Neighborhood meetings were held on June 10, 2014, and June 12, 2014. Fourteen people signed in at the first meeting for the Ocotillo Community and 137 people signed in at the Sun Lakes meeting. The Sun Lakes community meeting room capacity of 350 seats was full, despite the number of attendees indicated by the sign-in sheets. Comments and questions conveyed at both meetings related to timing of proposed construction, building heights, driveways, landscape, and issues outside the project scope relating to SRP power lines.

- Planning Staff and the applicant received several phone calls concerning immediate construction plans, what the amendment entails, and landscaping.

- At the time of this writing, Planning Staff is not aware of any formal opposition to this request.

PLANNING COMMISSION VOTE REPORT

Motion to Approve.
In Favor: 5 Opposed: 0 Absent: 2 (Baron, Cunningham)

A Sun Lakes resident expressed concerns to the Planning Commission that the proposed parking lot adjacent to their homes is not a compatible use due to health concerns. The resident indicated a group of homeowners is preparing a packet/document as to why the parking is not a good use and would provide alternatives and suggestions. At the time of this writing Planning Staff has not received the packet/document.

RECOMMENDED ACTION

Planning Commission and Planning Staff, upon finding consistency with the General Plan, recommend approval of the Preliminary Development Plan request subject to the following conditions:

1. Development shall be in substantial conformance with Exhibit A, Development Booklet, entitled "OCOTILLO CAMPUS PRELIMINARY DEVELOPMENT PLAN", kept on file in the City of Chandler Planning Services Division, in File No. PDP14-0007, except as modified by condition herein.

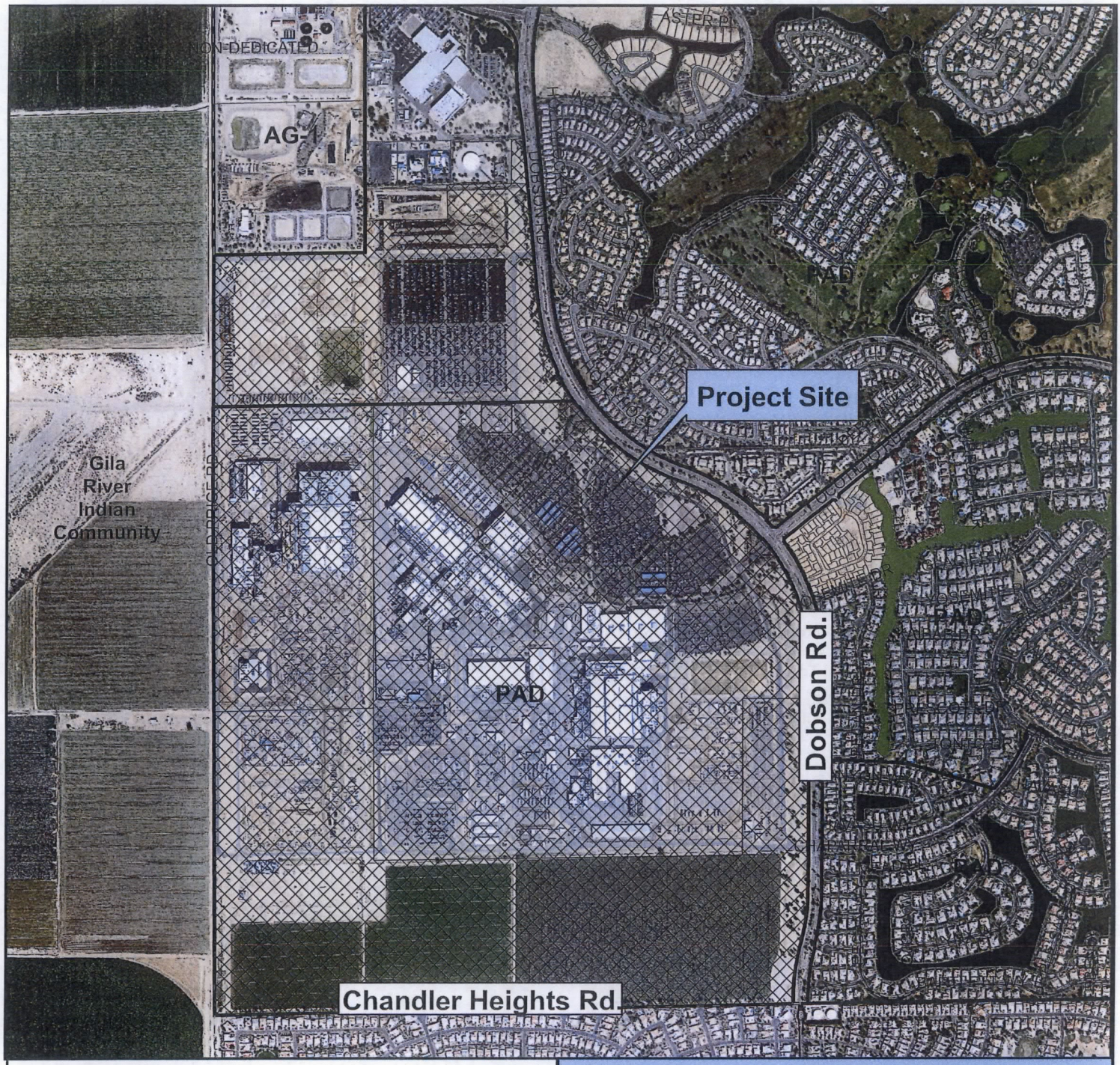
2. All buildings shall be designed to be consistent with the level of quality, detail, building material, paint colors, architectural articulation, and the like as established in the attached Development Booklet.

PROPOSED MOTION

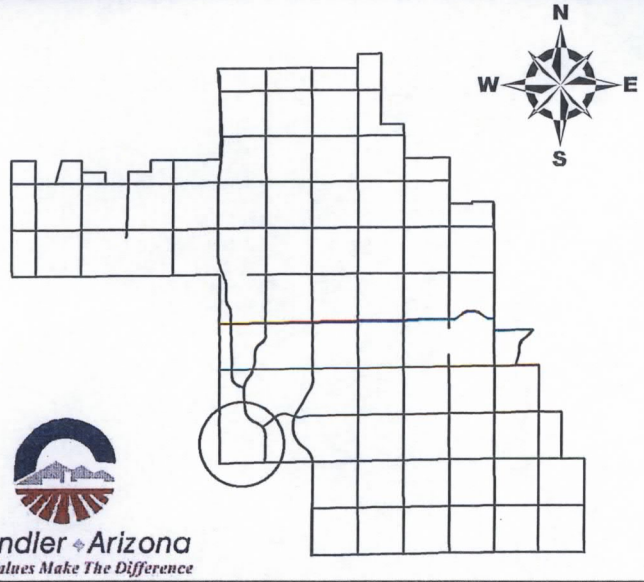
Move to approve PDP14-0007 INTEL OCOTILLO CAMPUS AMENDMENT NO. 4, Preliminary Development Plan, subject to the conditions as recommended by Planning Commission and Planning Staff.

Attachments

1. Vicinity Maps
2. Site Master Plan
3. Concept Elevations of future manufacturing facility
4. Exhibit A, Development Booklet



Vicinity Map



PDP14-0007

Intel Ocotillo Campus

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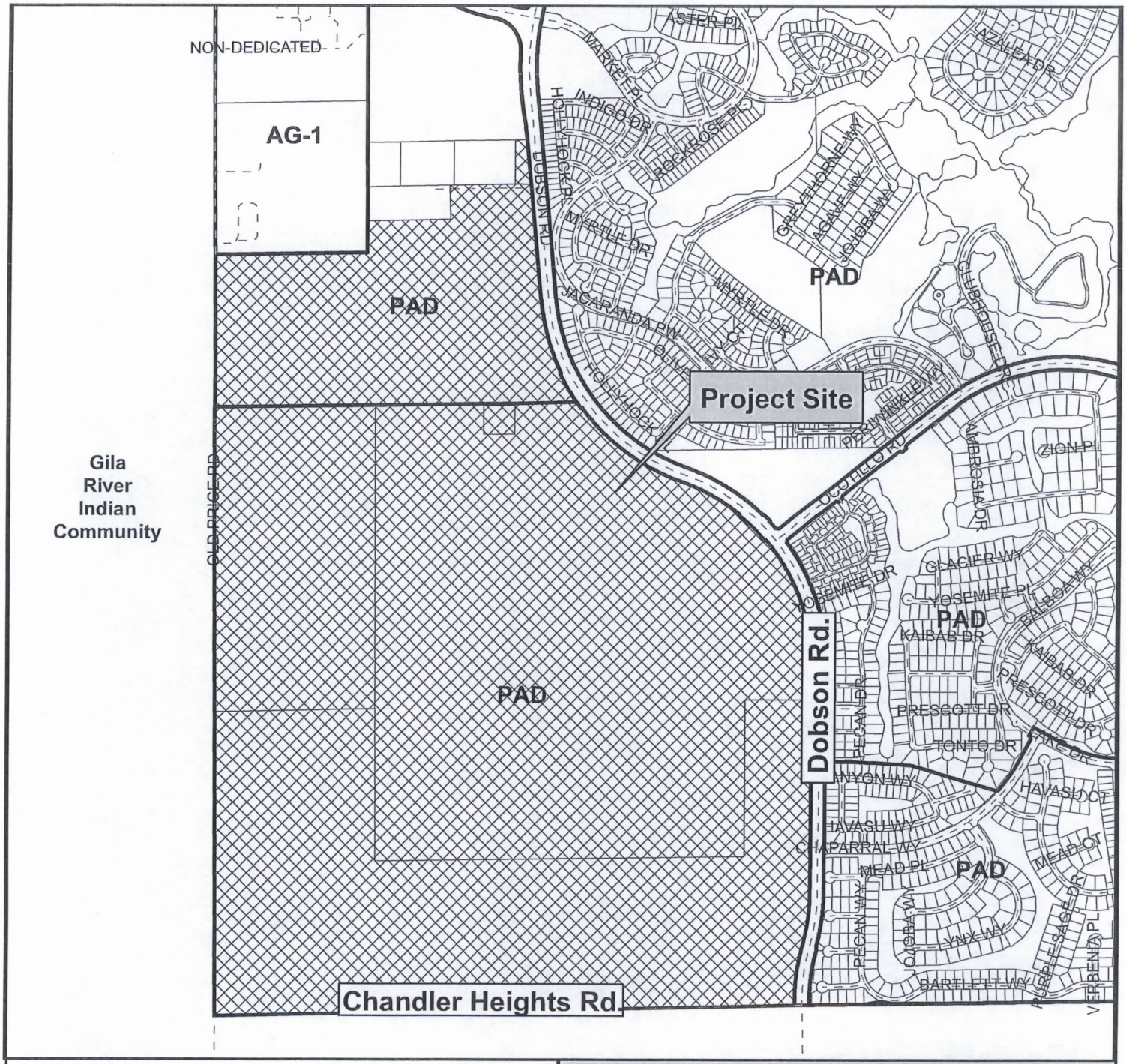
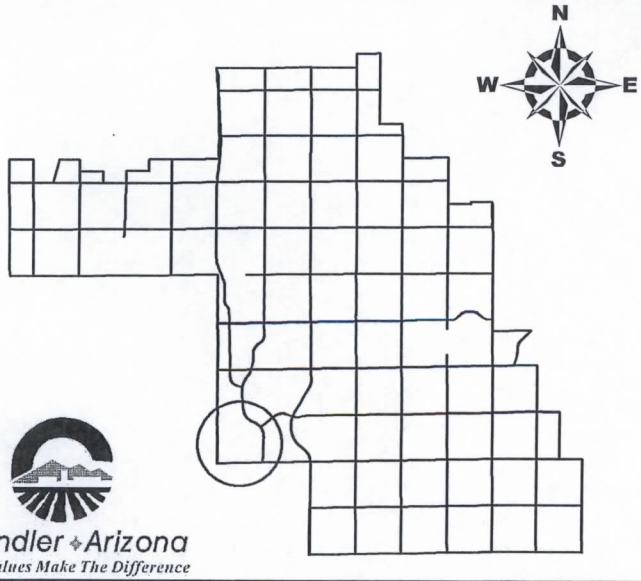


Vicinity Map



PDP14-0007

Intel Ocotillo Campus

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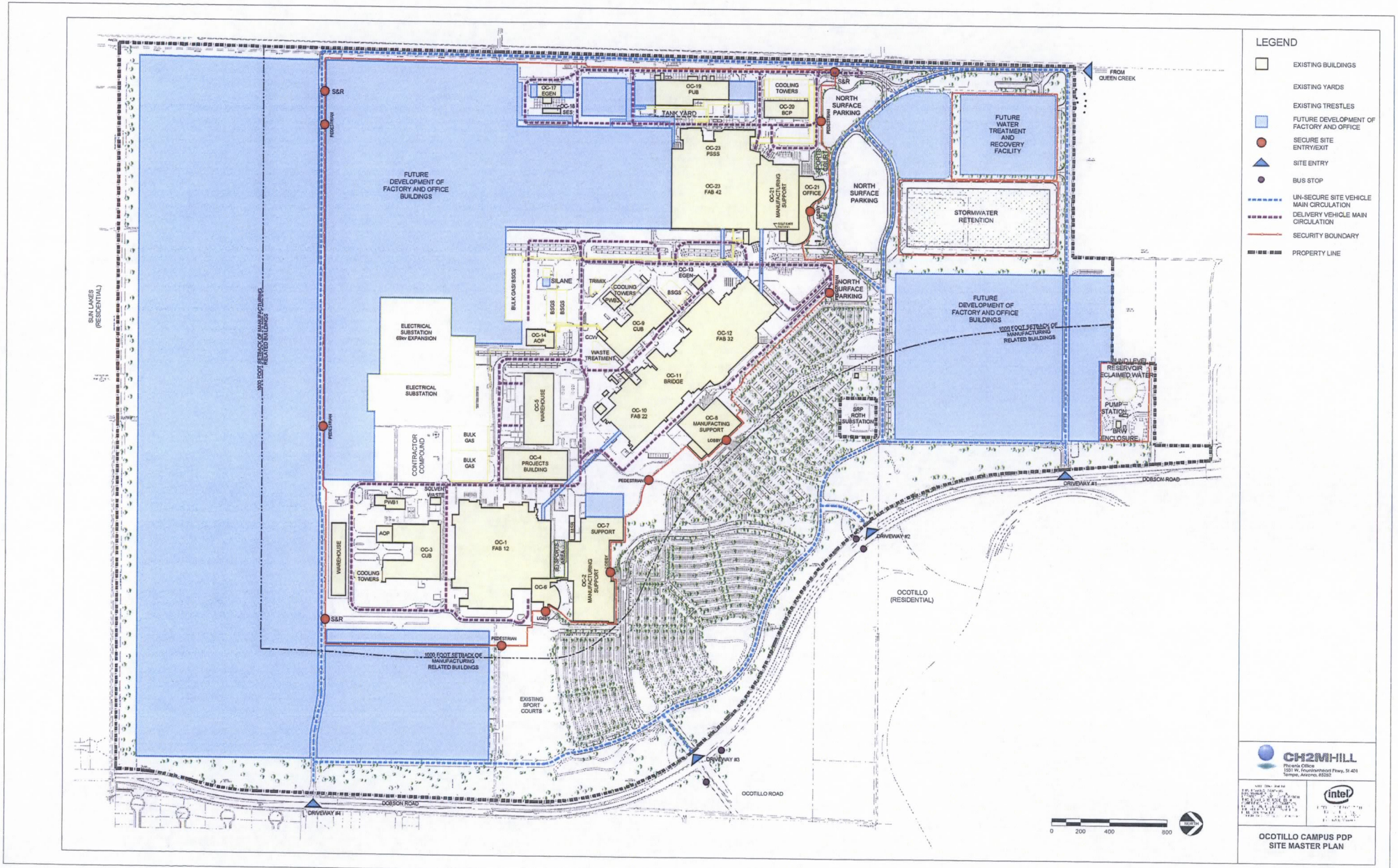
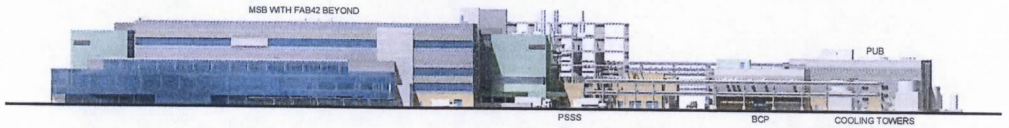
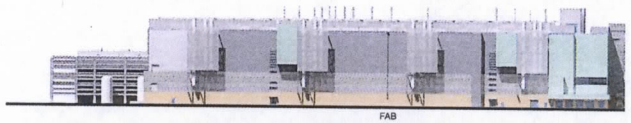
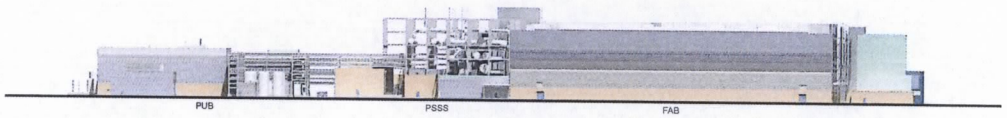

LEGEND
EXISTING BUILDINGS
EXISTING YARDS
EXISTING TRESTLES
FUTURE DEVELOPMENT OF FACTORY AND OFFICE
SECURE SITE ENTRY/EXIT
SITE ENTRY
BUS STOP
UN-SECURE SITE VEHICLE MAIN CIRCULATION
DELIVERY VEHICLE MAIN CIRCULATION
SECURITY BOUNDARY
PROPERTY LINE
FUTURE DEVELOPMENT OF FACTORY AND OFFICE BUILDINGS
FUTURE WATER TREATMENT AND RECOVERY FACILITY
NORTH SURFACE PARKING
STORMWATER RETENTION
OC-17 EGEN
OC-18 SES
OC-19 PUB
OC-20 BCP
OC-21 OFFICE
OC-23 PSSS
OC-23 FAB 42
OC-21 MANUFACTURING SUPPORT
TANK YARD
COOLING TOWERS
OC-13 EGEN
OC-14 AOP
OC-6 CUB
OC-12 FAB 32
OC-11 BRIDGE
OC-10 FAB 22
OC-8 MANUFACTING SUPPORT
OC-5 WAREHOUSE
OC-4 PROJECTS BUILDING
OC-1 FAB 12
OC-3 CUB
OC-7 SUPPORT
OC-2 MANUFACTURING SUPPORT
OC-9
ELECTRICAL SUBSTATION 69kv EXPANSION
ELECTRICAL SUBSTATION
CONTRACTOR COMPOUND
BULK GAS
BULK GAS/ BSGS
SILANE
TRIMIX
BSGS
PWB1
PWB2
WASTE TREATMENT
SOLVENT WASTE
WAREHOUSE
SRP ROTH SUBSTATION
LOW LEVEL RESERVOIR RECLAIMED WATER
PUMP STATION
BRW ENCLOSURE
EXISTING SPORT COURTS
1020 FOOT SETBACK OF MANUFACTURING RELATED BUILDINGS
SUN LAKES (RESIDENTIAL)
OCOTILLO (RESIDENTIAL)
OCOTILLO ROAD
DOBSON ROAD
FROM QUEEN CREEK
DRIVEWAY #1
DRIVEWAY #2
DRIVEWAY #3
DRIVEWAY #4
S&R
PEDESTRIAN
LOBBY
0
200
400
800
CH2MHILL
Phoenix Office
1511 W. Frontrunner Pkwy, St 401
Tempe, Arizona, 85282
intel
OCOTILLO CAMPUS PDP
SITE MASTER PLAN



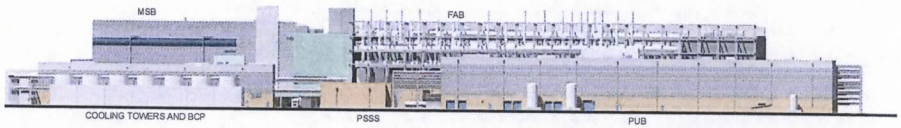
NORTH ELEVATION - ACTUAL EXISTING MANUFACTURING FACILITY
FOR REFERENCE ONLY - WILL NOT ALTER IN FUTURE DEVELOPMENT



EAST ELEVATION - CONCEPT FOR FUTURE MANUFACTURING FACILITY
FUTURE MANUFACTURING FACILITY TO CONCEPTUALLY ALIGN WITH EXISTING F42 EAST ELEVATION



SOUTH ELEVATION - CONCEPT FOR FUTURE MANUFACTURING FACILITY AT INTERIM PHASE BUILD-OUT AND SUPPORT BUILDINGS
FUTURE MANUFACTURING FACILITY TO CONCEPTUALLY ALIGN WITH EXISTING F42 SOUTH ELEVATION



WEST ELEVATION - CONCEPT FOR FUTURE MANUFACTURING FACILITY AND SUPPORT BUILDINGS
FUTURE MANUFACTURING FACILITY TO CONCEPTUALLY ALIGN WITH EXISTING F42 WEST ELEVATION

GENERAL NOTES

A SEE FAB42 PALETTE SHEET TO BE CONSIDERED FOR MANUFACTURING BUILDING EXPANSION.
ALL OTHER STAND ALONE BUILDINGS TO UTILIZE OR BE SYMPATHETIC WITH SURROUNDING ARCHITECTURE

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CONCEPT ELEVATIONS - FUTURE MANUFACTURING FACILITY