2014: The Year for Change
Updates on CALGreen, California Energy Codes, GreenPoint Rated & LEED v4

Wes Sullens

USGBC-NCC Diablo Valley / East Bay Branch
January 23, 2014
Agenda

Green Building Code Updates
Energy Code Updates
Rating System Updates
Industry Trends
Alameda County local government agency

Runs programs for waste prevention, waste diversion, education, green building, recycled materials, and sustainable landscaping

Provides model policies and tools for local programs: green building, C&D, sustainable landscaping, bag bans, mandatory commercial recycling

All cities and the county of Alameda have C&D policies and green building ordinances
CALGREEN UPDATES
California Green Building Standards Code 2013

California Code of Regulations
Title 24, Part 11

California Building Standards Commission
• Title 24 includes Parts 1-11
• Energy code (Pt. 6) is trending towards zero-net energy by 2020 (residential) & 2030 (commercial)
• CALGreen (Pt. 11) Mandatory Measures now cover all occupancies & all scopes of work
• Effective since January 1, 2011 for new construction
  – July 1, 2012 added large nonresidential additions/alterations
• Provides a set of **Mandatory Provisions** that are required for all new construction:
  – Basic quality construction practices
  – Green practices not addressed in the building code before
  – Duplication of requirements found elsewhere in the code
  – Additive to other code requirements
• CALGreen includes two voluntary “Tiers” that may be adopted via local amendment
CALGreen Measure Categories

- Indoor Air Quality
- Site Design
- Materials Efficiency & Recycling
- Construction Best Practices
- Water Conservation
- Energy Conservation
CALGreen Major Changes

effective January 1, 2014

1. CALGreen Mandatory Measures will apply to ALL residential “covered” occupancies

2. Mandatory Measures will apply to residential and nonresidential additions and alterations:
   - Residential: all additions/alterations that add floor area or volume
   - Nonresidential: additions >1000 sf and/or permit valuation >$200,000
WARNING

• Per Senate Bill 407: Noncompliant residential plumbing fixtures must be changed-out according to schedule, regardless of whether they are in scope
  • Must now meet EPAAct 1992 flush/flow rates for faucets, showerheads and toilets
  • Check with your building department...
Nonresidential Changes from v2010

- Mandatory Measures
  - Construction \textit{and} demolition waste now covered by recycling requirement
  - Updated formaldehyde limits for wood products
  - 80\% resilient flooring requirement (same as residential)
  - New measure for Supermarket refrigerant leak reduction
Residential CALGreen Tier Updates

- New measures:
  - walkability
  - bike parking
  - nonroof heat island reduction
  - Energy Star and water efficient appliances
- Minor changes to cool roofs, reflectivity
- Increased amounts of low-VOC resilient flooring:
  - Tier 1: 90% (was 80% in 2010)
  - Tier 2: 100% (was 90% in 2010)
Nonresidential Tiers

- Same changes as residential except:

- Electric Vehicle Charging
  - Tier 1: 3% of total parking spaces shall be capable of future EV charging stations (raceways provided)
  - Tier 2: 5% of total parking spaces

- Lots of other small changes
Analysis indicates a widening gap between CALGreen Tiers and LEED point scores from 2010 to 2013. The blue bars compare relative LEED scores for projects achieving CALGreen 2010 under the LEED 2009 rating system. The green bars compare CALGreen 2013 and LEEDv4 on a hypothetical project. The widening gap is attributable to the trajectory of LEEDv4 which has led to new credits in the rating system and a redefining of green building criteria. While CALGreen 2013 has a much larger pool of covered projects than its 2010 version, there have only been minor changes to the green building criteria, thus the resulting lower scores in comparison to LEEDv4.
CALGreen Resources

• The full code can be found at:
  – [www.bsc.ca.gov/CALGreen](http://www.bsc.ca.gov/CALGreen)

• Resource guides for interpreting & verifying Mandatory provisions in CALGreen:
  – [www.bsc.ca.gov/CALGreen](http://www.bsc.ca.gov/CALGreen) (Non-residential)
  – [www.hcd.ca.gov](http://www.hcd.ca.gov) (Residential)
  – [www.stopwaste.org/calgreen](http://www.stopwaste.org/calgreen) (unofficial guides)
THE 2013 ENERGY CODE
California’s Long-term Energy Efficiency Strategic Plan

On September 18, 2008, the California Public Utilities Commission adopted the California Long-Term Energy Efficiency Strategic Plan, with support from the Governor’s Office, the California Energy Commission, the California Air Resource Board, the state’s utilities, local government, and other key stakeholders.

The Long Term Energy Efficiency Strategic Plan is California’s single roadmap to achieving maximum energy savings in the state between 2009 and 2020, and beyond:

- It holds energy efficiency to its role as the highest priority resource in meeting California’s energy needs.
- It serves as the framework for making EE a way of life for all sectors in California – its industry, agricultural sector, large and small businesses and average households.
- It shows how California will use energy efficiency to grow its economy and meet its global warming goals.

The Plan contains the practical strategies and actions to attain significant statewide energy savings, as a result of a year-long collaboration by energy experts, utilities, businesses, consumer groups, and governmental organizations in California.

The Long Term Energy Efficiency Strategic Plan includes four “Big Bold strategies” as cornerstones for significant energy savings with widespread benefit for all Californians:

- All new residential construction will be zero net energy by 2020.
- All new commercial construction will be zero net energy by 2030.
- The Heating, Venting and Air Conditioning (HVAC) industry will be re-shaped to deliver maximum performance HVAC systems.
WHAT IS ZERO NET ENERGY?

Zero net energy is a general term applied to a building with a net energy consumption of zero over a typical year. To cope with fluctuations in demand, zero energy buildings are typically envisioned as connected to the grid, exporting electricity to the grid when there is a surplus, and drawing electricity when not enough electricity is being produced.

- The amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building.
- A ZNE building may also consider embodied energy — the quantity of energy required to manufacture and supply to the point of use, the materials utilized for its building.
Why?
ZNE
Centex Home, Livermore (2005)
Office, San Jose (2011)
2013 Energy Code Goals

- Reduce energy bills
- Increase energy reliability statewide
- Trending towards net zero energy buildings
- Help meet state’s GHG emissions reduction goals (AB 32)
- Reward projects that save energy during peak periods
- Improve quality of installation practices (HERS inspections)

*The new standards have been proven to be cost-effective*

*Even the CALGreen Tier thresholds are “cost-effective” over the long term*
Title 24 Part 6 Energy Code: Increased Stringency Overall

- Renewable energy encouraged
  - Minimum roof area reserved for future PV installation
- 2010 energy code “credits” are largely now mandatory
  - Lighting: Dimmable lamps/ballasts, Watts/sf reduced, daylighting controls (nonres)
  - Skylights (nonres)
  - HERS testing required on all projects
  - Exterior rigid insulation for homes (or 2x6 walls)
- Double pane, high performing low-e windows
- Cool roofs in all climate zones
- Radiant barriers in all climate zones
- Mandatory duct sealing
- Whole house ventilation system required
- 14 SEER/12 EER air conditioners [Fed stds ↑ 2015]
Why is the energy code delayed?
Residential CALGreen Tiers – Energy

Delayed until July 1, 2014

- New construction:
  - Tier 1: 15% improvement over base code
  - Tier 2: 30% improvement over base code
  AND
  - HERS rating of whole house
  - Quality of Insulation Installation (QII) inspection
  - High efficacy lighting

- Existing Buildings (add/alts that affect mech. systems):
  - Tier 1: 5-10% improvement over base code
  - Tier 2: 10-15% improvement over base code
Nonresidential CALGreen Tiers – Energy

Delayed until July 1, 2014

• All construction:
  • Tier 1: 5-10% improvement over base code, depending upon scope (lighting and/or mechanical in scope)

• Tier 2: 10-15% improvement over base code
  AND
  • 10% reduction in outdoor lighting energy
  • Solar water heating for restaurants
Anticipated costs for beating code...

**Residential:**
- New energy code is expected to be 15-30% more stringent than current code
- Cost for beating the 2013 energy code by 15% is expected to be 2x or more the incremental cost for exceeding the 2010 energy code by 15%

**Non-Residential:**
- 10-20% more stringent than current code
- Cost expected to be up to 2x current incremental cost
Strategies for beating code

“Peak Power Reductions”
- What will ensure lower energy use/demand during summer electricity peaks
- What will positively affect the coldest/hottest climate zones?

Strategies:
- Integrated design: good coordination is key
- Better Installation:
  - HERS testing, duct leakage, Quality Insulation Installation, etc.
- Better Equipment
  - Increased efficiency furnaces, air conditioners, condensers, hot water heaters/boilers, etc.
  - LED lights
  - Better windows
- Clean Renewable Energy
  - Solar hot water and/or photovoltaic systems
Where are codes headed?

- **Goal: Zero Energy Buildings**
  - 2016 codes Energy requirements likely to increase another 15-25% for residential and 5-10% for nonresidential
  - Non-regulated loads will dominate new home energy use
    - Appliances, plug loads, HERS score, etc.

- IAQ, water, waste becoming more important in State’s goals
  - Tighter homes = need for better IAQ
  - Water conservation a state priority
  - Waste is major part of AB 32 Scoping Plan update
    - 65% construction waste recycling may be mandatory for 2016 CALGreen
Rating System Updates

GreenPoint Rated
LEED for Homes
LEED BD+C
GreenPoint Rated Homes.

ASSURANCE OF A BETTER PLACE TO LIVE.

GreenPoint Rated provides you with a simple, affordable, and accessible rating system that reassures homebuyers that your homes are truly healthier and more energy efficient.
What Is GreenPoint Rated?

- Green home certification system based in California
- Third-party verified
- Awards points across 5 areas:
  - energy, water, resources, indoor air quality, community
- 50 point minimum

Over 21,000 Rated projects completed, 17,000 more in the pipeline
GreenPoint Rating Systems

New Home
- Single Family
- Multi-Family

Existing Home
- Single Family
- Multi-Family
Version 6.0 effective as of January 1, 2014

- Required Measures
  - CALGreen (4 points)
  - Energy performance (still using 2010 energy code until July)
- New certification levels
- Rating system alignment
  - Measure titles, points, manuals
- Updated Measures
Energy Performance:
GreenPoint Rated & CA Energy Code

- Energy Code
- GPR Rated

© 2013 Build It GREEN
Smart Solutions from the Ground Up
Version 6.0 Energy Performance

- Lower than 15% (likely 5-10%)
- 25 required energy points
- Cost-effective for builder & reach ordinances
- Referencing 3rd party evaluations
- Drive toward NZE goal by 2020
Version 6.0 Certification Levels (New Home)

Points

50
350

Levels

CERTIFIED 50-79
SILVER 80-109
GOLD 110-139
PLATINUM 140-300
Version 6.0 Minimum Points (New Home)

- **Energy: 25 points**
  Energy performance

- **Water Conservation: 6 points**
  Indoor water fixtures and plant selection

- **Indoor Air Quality: 6 points**
  Insulation, interior finished, ventilation

- **Resource Conservation: 6 points**
  Waste diversion, framing materials, flooring materials

- **Community: 2 points**
  Gathering areas, services, home size

- **Any Category: 5 Additional points**
Why now?
220,000 Projects are currently participating in LEED®, comprising more than 10.4 billion square feet of construction space.
147 COUNTRIES AROUND THE WORLD
Everyday, 1.5 million ft² of building space certifies to LEED.

International projects are more than 1/3 of new LEED registrations.
GREEN BUILDING MARKET

Source: McGraw-Hill Construction’s 2013 Dodge Construction Green Outlook
COMMERCIAL OFFICE MARKET SHARE

2008
- Total: $28 billion
- $8 Billion
- 30% Non-Green Share
- 70% Green Share

2011
- Total: $17 billion
- $8 Billion
- 47% Non-Green Share
- 53% Green Share

2012
- Total: $16 billion
- $9 Billion
- 54% Non-Green Share
- 46% Green Share

Source: McGraw-Hill Construction’s 2013 Dodge Construction Green Outlook
ENERGY CODE PROGRESS

Percent savings shown relative to previous version of Standard 90.1

Energy Use Index (1975 Use = 100)

Year


Standard 90-75
Standard 90A-1980
Standard 90.1-1989
Standard 90.1-1999
Standard 90.1-2001
Standard 90.1-2004
Standard 90.1-2007
Standard 90.1-2010

12% Savings
4% Savings
-0.5% Savings
11% Savings
5% Savings
19% Savings
CREATIVE TENSION

![Scales with Market and Urgency on either side]
21
BUILDING TYPES

NEW CONSTRUCTION
CORE AND SHELL
BD+C SCHOOLS BD+C
HEALTHCARE BD+WAREHOUSES
DISTRIBUTION CENTRES
HOMES MID-RISE
COMMERCIAL EXISTING BUILDINGS
ID+C HOSPITALS
DATA SERVICES
EBOM COMMERCE
EBOM RETAIL INTERIORS
EBOM SCHOOLS
EBOM HOSPITALITY
ND NEIGHBORHOOD
PLAN ND DEVELOPMENT
Making LEED A Better Fit

Adapting the rating system to better meet unique space type needs.
New Market Sectors
LEED Homes v4

V4 available now
required for new registrations starting June 2015
CREDIT CATEGORIES

Integrative Process

Location and Transportation
Sustainable Sites
Water Efficiency
Energy and Atmosphere
Materials and Resources
Indoor Environmental Quality

Existing LEED Structure
For predominantly residential projects:

- 1-4 stories – must use LEED for Homes
- 5–8 stories – must use LEED Multifamily Midrise
- 9–12 stories – may use Midrise or LEED BD+C
- 12+ stories – must use LEED BC+C
WATER EFFICIENCY

Major Changes

• Total Water Use (Performance pathway)
  • New credit, combines outdoor water budget tool with indoor water reduction calculator
  • Rewards total water use reduction over baseline

• Indoor Water Use
  • Added requirement that water pressure must be tested below 60 psi (for single family projects)
  • Added requirement that plumbing must be tested for leaks
Major Changes – Not many

• Still require:
  1. Ventilation to ASHRAE 62.2-2010 and 62.1-2010
     • Whole house ventilation, bath and kitchen fans exhausted to outside
  2. Combustion Venting
  3. Garage Pollutant Protection
  4. Radon-Resistant Construction
  5. Air Filtering
  6. Environmental Tobacco Smoke Control (for Multifamily)
     -ban smoking in common areas
  7. Compartmentalization (for Multifamily)
     -air seal each unit to minimize air/odor/sound transfer
ENERGY AND ATMOSPHERE

Major Changes

• Annual Energy Performance
  • ENERGY STAR for Homes v3 required
  • ENERGY STAR Multifamily Highrise commissioning, insulation/air sealing inspection required

• HERS 70 required

OR Use LEED Energy Metric
  • Must use less annual energy than similar ENERGY STAR Reference Home
  • OR 5% improvement over ASHRAE 90.1-2010

• Energy and water meters required
LEED BD+C
(Building Design & Construction)
FOCUS ON PERFORMANCE
LOCATION AND TRANSPORTATION
Highlights:

New credit category to improve alignment between commercial rating systems and LEED ND.

More performance-based credits with improved ties to anticipated outcome.

- bicycle facilities [link to bike network]
- quality transit [trip frequency, walking distance]
Performance in Sustainable Sites

SUSTAINABLE SITES
Highlights:

New credit for site assessment.

Financial support option in protect or restore habitat.

Major simplification to Light Pollution Reduction credit through new option for BUG rated equipment.
Performance in Water Efficiency
Highlights:

Addressing all water uses including fixtures & fittings, process, appliance, cooling towers, and outdoor water.

Focus on measuring water use through fundamental building metering requirements.

Additional points in credit for metering of subsystems.
Defining Performance in Energy & Atmosphere
Highlights:

Minimum Energy Performance: five percent above ASHRAE 90.1-2010; minimum ENERGY STAR score now 75.

New credit for Demand Response.

Building level energy metering required for all projects.
MATERIALS AND RESOURCES
Highlights:

Life cycle thinking approach to category.

Optional whole building life cycle assessment for new construction.

Focus on product transparency and outcomes through Building Disclosure & Optimization credits.

Increased stringency for construction & demolition waste recycling.
INDOOR ENVIRONMENTAL QUALITY
Highlights:

Category focused on key indicators of air, light, sound, and occupant experience.

More performance-based credits focused on health and wellbeing outcomes.

Systems approach to material emissions.
LEED CREDIT LIBRARY
More Trends in Green Building
most green materials claims today are for single attributes
What's the greenest option?
Can you prove it?
Trends for Materials in LEED v4

Multiple-benefit impact assessment of products

• Disclosure of Impact
  – Life Cycle Assessment
  – Extraction/Harvesting Practices
  – Materials Ingredients

• Optimization of Impacts
  – Lowest life-cycle impacts
  – Extraction best practices
  – Human Health
INFORMATION = IMPACT
LIFE CYCLE ASSESSMENT
75% of energy during laundry life cycle is consumed in the in-use phase.
Life Cycle Assessment  
Corporate sustainability driven strategy

- Leather sourced from the US
- Shipped to Portugal (inter-modal – truck, ship)
- Shipped back to US as finished product
- Round trip – 8,000 miles

Largest contribution to GHG was the upstream contribution related to leather production
LCA for Products: EPDs

- Environmental Product Declarations
  - Bring LCA principles to product-level declarations
Environmental Product Declaration

Typical Western Red Cedar Decking

Type III environmental declaration developed according to ISO 21930 and 14025 for average cedar decking products manufactured by the members of the Western Red Cedar Lumber Association.

Issued April 2011
Valid until April 2016

Scope: Cradle-to-grave.
Functional unit: 1 m² of decking assumed installed over a wood substructure.
Service life: 25 years.
System boundary: Life cycle activities from resource extraction through product use for a 25-year life span inclusive of maintenance, replacement and end-of-life effects. Wood-framed deck substitute is excluded as it is common to other decking types.
Geographic boundary: North America.

Figure 1: System boundary and process flows

Wood Decking

- Raw Material Extraction
- Fossil fuel
- Electricity
- Water
- Transportation
- Ancillary materials
- Other materials

Waste

- Emissions to air & water
- Solid waste
<table>
<thead>
<tr>
<th>Impact category</th>
<th>Unit</th>
<th>Per 1 m² of decking</th>
<th>Per 100 ft² of decking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total primary energy:</td>
<td>Mj</td>
<td>275.86</td>
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<td>Mj</td>
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<td>Non-renewable, nuclear</td>
<td>Mj</td>
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<td>Mj</td>
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<td>kg</td>
<td>8.14</td>
<td>75.60</td>
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<tr>
<td>Non-renewable material consumption (nails)</td>
<td>kg</td>
<td>0.10</td>
<td>0.91</td>
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<tr>
<td>Fresh water use</td>
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<td>0.30</td>
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<td>Total waste</td>
<td>kg</td>
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<tr>
<td>Hazardous</td>
<td>kg</td>
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<td>0.00</td>
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<tr>
<td>Non-hazardous</td>
<td>kg</td>
<td>8.24</td>
<td>76.51</td>
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<td>Acidification potential</td>
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<td>Smog potential</td>
<td>kg NO₂ eq</td>
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<tr>
<td>Ozone depletion potential</td>
<td>kg CFC-11 eq</td>
<td>2.55E-09</td>
<td>2.37E-08</td>
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</table>

SWHG: Solar, wind, hydroelectric and geothermal
Note: GWP includes all biogenic carbon sinks and sources throughout the product system boundary.

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<td>8.14</td>
<td>75.60</td>
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<td>1.95E-07</td>
<td>1.81E-06</td>
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</tbody>
</table>

SWHG: Solar, wind, hydroelectric and geothermal
Note: GWP includes all biogenic carbon sinks and sources throughout the product system boundary.
Best in class...

The best way to protect our forests is not cutting them down.
RESPONSIBLE FOREST MANAGEMENT

Ask for FSC Certified products and help save the environment
www.buyfsc.org
Corporate Responsibility

At Barrick, corporate responsibility is fundamental to our business strategy and defines who we are as a company.
THE SOCIAL JUSTICE LABEL

Your organization can contribute to the creation of a more equitable world.

It's time to make social justice your business.

JOIN JUST.

www.living-future.org
MATERIALS INGREDIENTS
# ACME Building Product

## Materials

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<th>Amount/serving</th>
<th>%DV*</th>
<th>Amount/serving</th>
<th>%DV*</th>
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<td>12%</td>
<td>Total Carb.</td>
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<td>Sat. Fat</td>
<td>3g</td>
<td>16%</td>
<td>Fiber</td>
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<tr>
<td>Trans Fat</td>
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<td></td>
<td>Sugars</td>
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<tr>
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<td>4%</td>
<td>Protein</td>
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<tr>
<td>Sodium</td>
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<tr>
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<td>Vitamin C</td>
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<tr>
<td>Calcium</td>
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<td></td>
<td>Calcium</td>
<td>6%</td>
</tr>
<tr>
<td>Iron</td>
<td></td>
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</table>

*Percent Daily Values (DV) are based on a 2,000 calorie diet.

INGREDIENTS: Enriched Wheat Flour (Unbleached Wheat Flour, Malted Barley Flour, Niacin, Reduced Iron, Potassium Bromate, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Vegetable Shortening (Partially Hydrogenated Soybean and Cottonseed Oils, Soybean Oil, Soybean Lecithin with Mono- and Diglycerides, Vitamin A Palmitate), Butter, Sugar, Contains 2% or less of: Leavening (Yeast, Baking Powder [Sodium Bicarbonate, Cornstarch, Sodium Aluminum Phosphate, Calcium Sulfate, Monocalcium Phosphate]), Non-Fat Dry Milk, Salt, Dough Conditioner (Wheat Flour, DATEM, Dextrose, Soybean Oil, Ascorbic Acid, L-Cysteine, Azodicarbonamide (ADA), Calcium Stearoyl-2 Lactylate, Enzymes), Eggs, Artificial Flavor, Preservatives (Calcium Propionate, Potassium Sorbate, Citric Acid).

ALLERGY INFORMATION:
CONTAINS: Eggs, Milk, Soy, Wheat
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: COREXIT® 9500
APPLICATION: OIL SPILL DISPERGANT
COMPANY IDENTIFICATION: Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, Texas
77487-0087

EMERGENCY TELEPHONE NUMBER(S): (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH: 1 / 1 FLAMMABILITY: 1 / 1 INSTABILITY: 0 / 0 OTHER: 0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

<table>
<thead>
<tr>
<th>Hazardous Substance(s)</th>
<th>CAS NO</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates, petroleum, hydrotreated light</td>
<td>64742-47-8</td>
<td>10.0 - 30.0</td>
</tr>
<tr>
<td>Propylene Glycol</td>
<td>57-55-6</td>
<td>1.0 - 5.0</td>
</tr>
<tr>
<td>Organic sulfonic acid salt</td>
<td>Proprietary</td>
<td>10.0 - 30.0</td>
</tr>
</tbody>
</table>
Disclosure isn’t new to California...

CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65)

To meet the requirements of Proposition 65, it is our responsibility to inform you of the following:

WARNING

Some products sold in this store contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.
iMac and the environment.

Apple designs products with the environment in mind. That’s why iMac is energy efficient, free of many harmful toxins, and highly recyclable.

Toxic Materials Removal

- Lead-free
- BFR-free
- PVC-free
- Mercury-free
- Arsenic-free glass
What replaces the bad stuff?
GreenScreen Benchmarks

- **Benchmark 1**: Avoid – Chemical of High Concern
- **Benchmark 2**: Use but Search for Safer Substitutes
- **Benchmark 3**: Use but Still Opportunity for Improvement
- **Benchmark 4**: Prefer – Safer Chemical
### GreenScreen

**Chemical Hazard Assessment (CHA)**

#### Table 4-1: Screening Level Toxicology and Exposure Summary

<table>
<thead>
<tr>
<th>Company</th>
<th>Chemical Information</th>
<th>% in Formulation</th>
<th>Human Health Effects</th>
<th>Ecotoxicity</th>
<th>Environmental</th>
<th>Potential Routes of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cancer Hazard</td>
<td>Skin Sensitizer</td>
<td>Reproductive</td>
<td>Developmental</td>
</tr>
<tr>
<td>Albemarle</td>
<td>ANTIBLAZE 180 and ANTIBLAZE 195</td>
<td>95%</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Albemarle</td>
<td>ANTIBLAZE 182 and ANTIBLAZE 205</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tris(1,3-dichloro-2-propyl)Phosphate CAS # 13674-87-8</td>
<td></td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Albemarle</td>
<td>ANTIBLAZE V500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proprietary A Chlooroalkyl phosphate (1)</td>
<td></td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Proprietary B Aryl phosphate</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M*</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Triphenyl Phosphate CAS # 115-86-6</td>
<td></td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Albemarle</td>
<td>SAYTEX RX-8500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proprietary D Reactive brominated flame retardant</td>
<td></td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Proprietary B Aryl phosphate</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M*</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Triphenyl Phosphate CAS # 115-86-6</td>
<td></td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>

* Ongoing studies may result in a change in this endpoint
* Persistent degradation products expected

L = Low hazard concern  
M = Moderate hazard concern  
H = High hazard concern  
P = Yes for pure chemical  
N = Yes  
Y = No

L, M, or H = Endpoint assigned using estimated values and professional judgment (Structure Activity Relationships)
Disclosure & Assessment Standards
# Product scorecard

**ALUMINIUM LIGHTING COLUMN**

**Sapa Pole Products**

silver certified

---

## CRADLE TO CRADLE CERTIFIED<sup>SM</sup> PRODUCT SCORECARD

<table>
<thead>
<tr>
<th>QUALITY CATEGORY</th>
<th>BASIC</th>
<th>BRONZE</th>
<th>SILVER</th>
<th>GOLD</th>
<th>PLATINUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIAL HEALTH</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATERIAL REUTILIZATION</td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RENEWABLE ENERGY &amp; CARBON MANAGEMENT</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER STEWARDSHIP</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOCIAL FAIRNESS</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVERALL CERTIFICATION LEVEL</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Sapa Pole Products** is a leading aluminium lighting column manufacturer, with a focus on sustainability and innovation. Their products are designed to meet the highest standards of environmental and social responsibility.

Renewable and energy-efficient, Sapa Pole Products' aluminium lighting columns contribute to a sustainable future. With a commitment to social fairness, these products are manufactured with the highest ethical standards, ensuring fair labor practices and community engagement.

**Certification**

This product is Certified Silver under Version 2.1.1 of the Cradle to Cradle Certified Product Standard.
The Living Building Challenge publishes a “Red List” of materials to be avoided in buildings seeking certification under the Living Building Challenge. What’s on it?

- Asbestos
- Cadmium
- Chlorinated Polyethylene and Chlorosulfonated Polyethylene
- Chlorofluorocarbons (CFCs)
- Chloroprene (Neoprene)
- Formaldehyde
- Halogenated Flame Retardants
- Hydrochlorofluorocarbons (HCFCs)
- Lead
- Mercury
- Petrochemical Fertilizers and Pesticides
- Phthalates
- Polyvinyl Chloride (PVC)
- Wood treatments containing creosote, arsenic or pentachlorophenol
Intentionally simple in scope. By focusing on product ingredients, we hope to ‘level the playing field’ and create a platform for constructive conversations about the human health and ecological impacts of the decisions we make.

Options: Take back program; Salvageable or reusable; Recyclable (%); Landfill; Hazardous waste (%).

Raw Material and Final Assembly locations assist project teams in meeting the Appropriate Sourcing Imperative, intended to support the growth of regional economies rooted in sustainable practices, products and services.

All constituent parts of a product. Items are color coded to communicate potential hazards:
- Living Building Challenge Red List
- US EPA Chemical of Concern
- Action Plan Published
- ECHA REACH Substance of Very High Concern
- Candidate
- Not referenced in any of the three programs noted above

Temporary Red List chemical exceptions applied for specific product types.

Declare identifier for company + product
- Valid for 12 months, starting with the date of issue
- CSI MasterFormat 2010 classification

Verification that a product complies with the Living Building Challenge Red List.
PTD Product Transparency Declaration

A Clear View of what’s Inside your Flooring Products

See the exposure risks not just the ingredients!

Easily identify and assess:
• Health Information
• VOC emissions/content
• Heavy Metals

PTD identifies exposure risks for:
• Building occupants
• Contractors

Six authoritative hazard lists? ✓ Check!

The PTD discloses whether or not the products ingredients are present on six hazard lists published by authoritative sources.

Volatile emissions compliance? ✓ Check!

The PTD declares whether product VOC emissions/content comply with appropriate IAQ requirements.

Warning notifications? ✓ Check!

The PTD tells specifiers whether the product needs a warning notification or label to alert product installers or building occupants about any potential exposure to harmful ingredients.
LEEDv4

MR Credits
Building Product Disclosure and Optimization

Environmental Product Declarations
Sourcing of Raw Materials
Material Ingredients
OPTION 1. EPDS

20 minimum number of products

5 maximum number of different manufacturers
LIVING BUILDING CHALLENGE™
2.1

A Visionary Path to a Restorative Future

INTERNATIONAL LIVING FUTURE INSTITUTE™

May 2012
Bullitt Center, Seattle

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>100% onsite</td>
</tr>
<tr>
<td>Water</td>
<td>100% onsite</td>
</tr>
<tr>
<td>Sewer</td>
<td>No hookup</td>
</tr>
<tr>
<td>Waste</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Red List Chemicals</td>
<td>zero</td>
</tr>
</tbody>
</table>
CHANGE AGENT: a person or thing that encourages people to change their behavior or opinions
Wes Sullens
StopWaste
Oakland, CA
510-992-3636
wsullens@stopwaste.org