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When Brown Meets Green: Integrating Sustainable Development Principles into Brownfield Redevelopment Projects

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By definition, the redevelopment of formerly contaminated sites, commonly known as brownfields[1], seeks to restore land to a more environmentally-sound condition. Federal, state, and local governments have long encouraged such efforts by offering developers numerous tax and other financial incentives in return for bringing these sites back into productive use. Such tax and financial incentives are often critical in encouraging the ultimate redevelopment of these contaminated sites, because these projects would otherwise be considered to be completely "upside down" from a financial risk perspective.[2]

Governments are now encouraging even more interrelationship between brownfields redevelopment and "green" practices by incentivizing sustainable environmental practices in both brownfields remediation as well as brownfields redevelopment. The interrelationship among these concepts is both natural and logical.

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[1] Brownfields are abandoned, idled, or underused industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination. *See* EPA Region 3 Green Buildings webpage, <http://www.epa.gov/region03/p2/building.htm> EPA has estimated that there are 450,000 to 1,000,000 brownfields sites nationwide.

[2] Typical tax and financial incentives commonly used in brownfield redevelopment projects include brownfields assessment grants from the Environmental Protection Agency ("EPA"); brownfield revolving loan funds from the EPA; tax increment financing; Brownfield Economic Development Initiative ("BEDI") grants and Community Development Block Grants ("CDBG") from the U.S. Department for Housing and Urban Development ("HUD"); New Market Tax Credits; transportation and community system preservation ("TCSP") pilot grants from the U.S. Department of Transportation ("DOT"); historic rehabilitation tax credits; low income housing tax credits; industrial development bonds; and energy efficiency construction credits.

In recent years both the Environmental Protection Agency ("EPA") and state and local governments have married the existing interest in redeveloping brownfield sites with the concept of constructing "green" buildings on such sites. With the growing concern about climate change and the contribution that buildings have upon carbon emissions into the environment, there has been an explosion of "green building" statutes and ordinances at the state and local level, many of which have impacted brownfields redevelopment. As a result of such general concern and a new legal and regulatory regime, a trend has developed of integrating sustainable building principles into the redevelopment of brownfields.

For instance, urban projects that are being built upon contaminated sites are being encouraged to retain and manage their stormwater on-site, to conserve energy and water, to install more efficient insulation, and to plant trees. In many jurisdictions, developers can obtain approval of their building plans more quickly if they incorporate sustainable redevelopment principles into their plans.[3]

Even more recently, the focus on environmentally-sound brownfields policy has expanded to include incorporating sustainable environmental practices into the remediation of contaminated sites. Such principles can be implemented long before any "green" buildings are erected on a former brownfields site. While this area of focus is relatively new, it is very likely that governments at all levels will offer incentives to developers to engage in sustainable practices in their remediation efforts, in addition to their redevelopment efforts.

I. GREEN REMEDIATION

A. Fundamental Principles

Green remediation is defined as the practice of considering all environmental effects of remedy implementation and incorporating options to maximize the net environmental benefit of cleanup actions.[4] Regardless of the cleanup remedy chosen, opportunities exist to increase sustainability throughout the investigation, design, construction, operation, and monitoring phases of site remediation.[5] Green remediation seeks to reduce the immediate environmental impact of remediation activities, as well as collateral environmental damage, to include negative impacts such as:

- Air pollution caused by toxic or priority pollutants such as particular matter and lead;
- Water cycle imbalance within local and regional hydrologic regimes;
- Soil erosion and nutrient depletion, as well as subsurface geochemical changes;
- Ecological diversity and population reductions; and
- Emission of carbon dioxide, nitrous oxide, methane, and other greenhouse gases.[6]

The overall objectives of green remediation are to:

- Achieve remedial action goals;
- Support the use and reuse of remediated parcels;
- Increase operational efficiencies;

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[3] District of Columbia Green Building Act of 2006, D.C. Law 16-234.
[4] Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites, U.S. EPA Office of Solid Waste and Emergency Response, April 2008.
[5] *Id.*
[6] *Id.*

- Reduce total pollutant and waste burdens on the environment;
- Minimize degradation or enhance ecology of the site and other affected areas;
- Reduce air emissions and greenhouse gas production;
- Minimize impacts to water quality and water cycles;
- Conserve natural resources;
- Achieve greater long-term financial return from investments; and
- Increase the sustainability of cleanups.[7]

Green remediation addresses six core elements: energy requirements of the treatment system; air emissions; water requirements and impacts on water resources; land and ecosystem impacts; material consumption and waste generation; and long-tem stewardship actions.[8]

1. Energy requirements of the treatment system

Redevelopers should consider using passive-energy technologies that require little or no demand for external utility power, as well as installing renewable energy systems to replace or otherwise offset electricity requirements. They should also seek to use the most energy efficient equipment available, and to maintain that equipment at its peak performance. Finally, they should periodically evaluate and optimize the energy efficiency of their equipment.[9]

2. Air emissions

Air emissions in remediation sites come from both the equipment used in remediation, as well as from releases of substances from the site itself. Green remediation can address both aspects. Redevelopers may minimize the use of heavy equipment that requires high volumes of fuel, as well as use cleaner fuels and retrofitted diesel engines on such equipment. Additionally, they should strive to reduce the atmospheric release of toxic or priority pollutants and minimize the dust export of contaminants.[10]

3. Water requirements and impacts on water resources

Redevelopers should strive to minimize their consumption of fresh water, as well as to maximize water reuse, to include reclaiming treated water for purposes such as irrigation. They should also try to prevent negative impacts on the water quality of nearby bodies of water, *e.g.*, nutrient loading.[11]

4. Land and ecosystem impacts

While a certain amount of disturbance of the land is inevitable in a brownfields remediation, redevelopers should seek to minimize the impact. For instance, they may use minimally-invasive *in situ* technologies, or use passive energy technologies such as bioremediation or phytoremediation where possible. They should seek to minimize the disturbance of both soil and habitat, as well as the bioavailability of certain contaminants through contaminant source and plume controls. Finally, they should reduce noise and lighting disturbances when possible.[12]

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[7] *Id.*
[8] *Id.*
[9] *Id.*
[10] *Id.*
[11] *Id.*
[12] *Id.*

5. Material consumption and waste generation

There are also opportunities to reduce the consumption of materials and to similarly limit the amount of waste that is generated by remediation efforts. Whenever possible, redevelopers should reuse and/or recycle materials generated at or removed from the site. In addition, they should use technologies that are designed to minimize waste generation, and minimize the extraction and disposal of natural resources. Finally, to the extent feasible, they should use passive sampling devices that produce minimal waste.[13]

6. Long-term stewardship actions

The negative effects of remediation activities can linger long after the remediation work has been completed, but positive effects can also linger. For instance, redevelopers can integrate an adaptive management approach into the site's long-term controls and install renewable energy systems to provide power for long-term and future activities on the land, helping to reduce the emission of greenhouse gases. They should also seek to use passive long-term monitoring sampling devices when possible. Finally, they should involve the community in order to increase the public's awareness and acceptance of long-term activities and restrictions at the site.[14]

B. Case Studies

1. Rhizome Collective Inc. Brownfield Site, Austin, TX

The objective of this clean-up was to remediate an illegal dump containing 5,000 cubic yards of debris. As part of a green remediation strategy, the redevelopers constructed an evapotranspiration cover; salvaged wood scraps and concrete for erosion control; recycled 31.6 tons of metal; salvaged concrete for later use as fill for building infrastructure; powered equipment through biofuel generators and photovoltaic panels; extracted 680 tires with a vegetable oil-powered tractor; inoculated chainsaws with fungi spore-laden oil to aid in degradation of residual contaminants; constructed a floating island of recovered plastic to create a habitat for life forms capable of bioremediating residual toxins in an onsite retention pond; and planted native grasses, wildflowers, and trees. With the help of the community, the property was restored to wildlife habitat for native and endangered species within one year.[15]

2. Former Nebraska Ordnance Plant

The objective of this clean-up was to remove trichloroethene and destroy explosives in groundwater. The remediation effort utilized a 10-kW wind turbine to power groundwater circulation wells for air stripping and UV treatment. The wind power provides sufficient energy for continued trichloroethene removal and explosives destruction by the aboveground treatment system during grid inter-tie operation, and reduces the consumption of utility electricity by 26 percent during such operation. It decreases carbon dioxide emissions by 24-32 percent during off-grid

[13] *Id*.
[14] *Id*.
[15] *Id*.

operation, and returns surplus electricity to the grid for other consumer use. The electricity costs savings are expected to total more than $40,000 over the next fifteen years.[16]

II. GREEN BUILDINGS

A. Fundamental Principles

The Environmental Protection Agency ("EPA") defines green or sustainable building as the practice of creating healthier and more resource-efficient models of construction, renovation, operation, maintenance, and demolition.[17] "Green building" is a generic term that refers to the practice of increasing the efficiency of building systems and reducing the environmental impacts of buildings through improved construction, design, operation, and maintenance.[18] From the initial design and site selection phase, to occupancy and ultimate removal, green buildings are designed to be "environmentally friendly," with minimal negative impact on the environment.[19]

The environmental community and the nation at large have become increasingly aware of the profound impact that buildings can have on the environment. For example, tremendous amounts of water, energy, and materials are used in the construction, operation, maintenance, and removal of buildings. Specifically, it is estimated that buildings in the United States account for 30 percent of greenhouse gas emissions and 65 percent of electricity consumption, 36 percent of overall energy use, 30 percent of raw materials use, 30 percent of waste output, and 12 percent of potable water consumption.[20] Buildings generate a substantial amount of waste, create storm water runoff, and contribute to air and water pollution. Further, buildings produce indoor air pollution that can negatively affect performance and lead to health problems such as asthma.[21] Roads and parking lots that typically accompany buildings often serve as a conduit for non-point source pollution.[22] Also, the building process itself can greatly affect the surrounding environment and ecosystem.

Green building is designed to lessen or eliminate these potentially harmful environmental effects by incorporating certain features and strategies into the various stages of building development. Some environmental benefits of green building include enhancing and protecting biodiversity and ecosystems, improving air and water quality, reducing waste streams, and conserving and restoring natural resources. Generally, green building promotes energy efficiency and renewable energy, water stewardship, waste reduction, and sustainable development.[23] By lessening the demand for energy and natural resources, green building helps to conserve the Earth's resources and to promote sustainability into the future.

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[16] *Id*.
[17] *See* EPA Green Building webpage, <http://www.epa.gov/greenbuilding/index.htm>
[18] *See* EPA Memorandum "Supplemental Environmental Projects: Green Building on Contaminated Properties," July 2004, <http://www.epa.gov/compliance/resources/policies/cleanup/brownfields/sep-redev-fs.pdf>. Performance and environmental impacts are considered from the initial design phase of a building and continue for the full life-cycle of the building. *Id*.
[19] *See* EPA Region 3 Green Buildings webpage, <http://www.epa.gov/region03/p2/building.htm>. Green buildings are also described as high performing energy, water, and resource efficient buildings. *Id*.
[20] *See* United States Green Building Council website, A National Green Building Research Agenda (November 2007) <http://www.usgbc.org/ShowFile.aspx?DocumentID=3402>
[21] *See* EPA Memorandum "Supplemental Environmental Projects: Green Building on Contaminated Properties," July 2004, <http://www.epa.gov/compliance/resources/policies/cleanup/brownfields/sep-redev-fs.pdf>
[22] *Id*.
[23] *See* EPA Green Building webpage, <http://www.epa.gov/greenbuilding/index.htm>

Economic benefits of green building include reduction of operating costs, enhancement of asset value and profits, expansion of markets for green products and services, and increased productivity for building occupants. Green building also offers many benefits to people and communities, including improved air, enhanced comfort and health, decreased strain on local infrastructure, and improvement in overall quality of life.[24]

Common features of green buildings are more fully described below.

1. Typical features of green buildings

Designers and builders of green buildings are encouraged to incorporate several features and concepts into their plans. These include: (1) careful site selection to minimize impacts on the surrounding environment and increase alternative transportation options; (2) energy conservation to ensure efficient use of natural resources and reduced utility bills; (3) water conservation to ensure maximum efficiency and reduced utility bills; (4) responsible storm water management to limit disruption of natural watershed functions and reduce the environmental impacts of storm water runoff; (5) waste reduction, recycling, and use of "green" building materials; (6) improved indoor air quality through the use of low volatile organic compound ("VOC") products and careful ventilation practices during construction and renovation; (7) reduced urban heat island effect to avoid altering the surrounding air temperatures relative to nearby rural and natural areas; and (8) landscaping that benefits the surrounding environment and involves minimal pesticide use. Some of these features are discussed in more detail below.

a. Site selection

Site selection is a key component in the green building process. The construction of green buildings near public transportation is encouraged in order to help reduce the environmental impacts associated with daily automobile use.[25] Additionally, using brownfield sites for new green buildings is considered ideal, as it revives these sites and promotes growth and development.

b. Energy and water conservation

Green buildings should be designed to conserve water and energy. For example, photovoltaic panels limit the amount of energy needed from the power grid.[26] A device that helps conserve water is a self-supporting filtration unit, which reduces the amount of water that must be sent off-site for treatment.[27] Builders are encouraged to install devices such as these in order to reduce the unnecessary use of resources in the operation of buildings.

c. Waste reduction, recycling, and use of green materials

Taking steps to minimize waste is another key component of green building. Using recycled materials in the construction of buildings is important in order to limit the number of resources that

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[24] *See* United States Green Building Council website, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=291&>
[25] *Id*.
[26] *See* <http://www.greenglobes.com>
[27] *Id*.

must be disturbed.[28] For instance, the EPA recommends using decking materials made from recycled plastics and reclaimed wood rather than traditional wood. Additionally, using materials that are manufactured locally cuts down on the shipping and transporting of these materials, thereby reducing energy consumption.[29]

d. Improved indoor air quality

Materials with limited amounts of VOCs should be used in green buildings. Adequate ventilation must also be provided in order to protect building occupants from VOCs and radon gas.[30]

e. Reduced urban heat island effect

This phenomenon describes urban and suburban temperatures that are 2° to 10°F (1° to 6°C) warmer than nearby rural areas.[31] Elevated temperatures can impact communities by increasing peak energy demand, air conditioning costs, air pollution levels, and heat-related illness and mortality.[32] The impact of heat islands can be lessened by implementing several "heat island reduction strategies," which include installing cool or vegetated green roofs, planting trees and vegetation, and switching to cool paving materials.[33]

f. Beneficial landscaping

Landscaping that involves little or no pesticides or irrigation to maintain is encouraged. The EPA also recommends ensuring that buildings have adequate shade, which cuts down on the amount of energy needed to keep them cool.

B. Brownfields Redevelopment, Green Building Features, and the Rating Systems

The United States Green Building Council ("USGBC") has created a nationally-recognized green building rating system with specific standards for what constitutes a green building. The rating system designed by the USGBC is referred to as the Leadership in Energy and Environmental Design ("LEED")® Green Building Rating System. The LEED® Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings.[34] LEED® promotes a whole-building approach to sustainability and provides the building industry with credible standards for what constitutes a green building.[35]

Using contaminated brownfields sites for new green buildings is considered ideal as it revives these sites and promotes growth and development. Site selection is a key component in the green

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[28] *Id*.
[29] *Id*.
[30] *Id*. Radon is a colorless, radioactive, inert gas formed from the disintegration of radium that sometimes enters
homes and buildings. *Id*.
[31] *See* Greening EPA Glossary webpage, <http://www.epa.gov/greeningepa/glossary.htm#heatisland>
[32] *See* EPA Heat Island Effect webpage, <http://www.epa.gov/heatisland/>
[33] *Id*.
[34] *See* U.S. Green Building Council website, <http://www.leedbuilding.org/DisplayPage.aspx?CategoryID=19>. The USGBC was formed in 1996 and grew steadily over the first five years. Over the last five years, however, the USGBC has enjoyed significant growth.
[35] *Id*.

building process. The construction of green buildings near public transportation is encouraged in order to help reduce the environmental impacts associated with daily automobile use.[36] According to the LEED® rating system, version 2.2. for New Construction, a project can receive one (1) point[37] (SS credit 1) under the Site Selection category for avoiding development of an inappropriate site[38] and one (1) point (SS credit 3) under the Brownfield Redevelopment category for rehabilitating damaged sites where redevelopment is complicated by environmental contamination.[39] The developer must demonstrate that the project qualifies as a brownfields site by conducting a Phase II Environmental Site Assessment pursuant to ASTM E 1903-97 or demonstrating that the site has been designated as a brownfield site by a local, state or federal government agency. The developer must also describe the site contamination and the remediation efforts undertaken by the project.

It is important to note that LEED® credits are available under a number of additional categories for attributes that are commonly found at many brownfields sites, such as Development Density & Community Connectivity (1 point), Public Transportation Access (1 point), On-Site Renewable Energy (1 to 3 points), and Building Reuse (1 point). Brownfields redevelopment projects may also receive innovation and design ("ID") credits for comprehensive strategies that demonstrate quantifiable environmental benefits that are not specifically addressed by the current LEED® rating system. ID credits have been available for features such as brownfield rehabilitation of adjacent non-project site; site storm water management and creek rehabilitation; donation and preservation of open space; radon mitigation; and clearing of invasive species.

The Green Globes rating system likewise provides points for reusing contaminated brownfields sites.[40] Under the site development category of the Green Globes rating system, a project may receive thirty (30) points if it is a remediated brownfield site.

As the U.S. Green Building Council and the Green Globes ratings system consider further changes to their current rating systems, they may evaluate the benefits of giving even more credits to projects incorporating green building principles into brownfields redevelopment projects, given the positive impact that the combination of incorporating green building principles into projects that are reusing and cleaning up contaminated brownfields sites would have upon the environment. Such efforts are underway. The National Brownfields Association has recently recommended to the USGBC that it raise the value of building on a brownfield site to a weight of up to five points.[41]

C. EPA's "Green Buildings on Brownfields" Initiative

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[36] *See* LEED® for New Construction & Major Renovations, <http://www.usgbc.org/ShowFile.aspx?DocumentID=1095>

[37] A minimum of 26-32 points are required to become LEED® Certified; 33-38 points to be LEED® Silver; 39-51 points to be LEED® Gold; and 52-69 points to be LEED® Platinum. The brownfields redevelopment point is available as Credit 3.

[38] Inappropriate sites include: prime farmland; previously undeveloped land whose elevation is lower than 5 feet above the elevation of the 100 year flood plain; land that is habitat for threatened or endangered species; land that is within 100 feet of a wetland; undeveloped land that is within 50 feet of a water body that could support fish, recreation or industrial use; and land that was public parkland.

[39] Given the "upside down" nature of brownfields projects, it would be helpful if the U.S. Green Building Council were to consider increasing the number of credits available for the redevelopment of contaminated brownfields sites.

[40] *See* <http://www.greenglobes.com>

[41] NBA Moves to Change LEED(R) Weighting for Brownfields, <http://www.brownfieldnews.com/newsletter/2008/july/Policy.html>

The EPA's Brownfields Program was designed to empower those in economic development to assess, remediate, and reuse brownfields in a sustainable manner.[42] The Green Buildings on Brownfields Initiative is an EPA effort designed to promote the use of green building techniques at brownfield properties in conjunction with assessment and cleanup.[43] Through these pilot projects, EPA will be able to provide communities with technical assistance to facilitate the redevelopment of green buildings on brownfields.[44] The theory is that constructing environmentally-friendly buildings on formerly contaminated (or perceived to be contaminated) property can be symbolic of a new, environmentally-sound direction for communities, as well as tangible growth for their economies.[45]

1. EPA Brownfields Sustainability Pilots

The EPA recently announced its intention to provide more than $500,000 in funding for technical assistance for sixteen Brownfields Sustainability Pilots throughout the country. The assistance is intended to support activities such as the reuse and recycling of construction and demolition materials, green building and infrastructure design, energy efficiency, water conservation, renewable energy development, and native landscaping.[46] The pilot projects include the analysis of green roof systems for a brownfields project in Roxbury, Massachusetts; a feasibility analysis of reusing and recycling materials from closed textile mills in Valley, Alabama; green building and green infrastructure design at a former smelter in San Juan County, Colorado; and assistance with applying green building principles and providing community training at a former gas station being converted into a community center in Portland, Oregon.[47] Such projects demonstrate EPA's continuing commitment to sustainability for all facets of brownfields remediation and reuse.

2. Green Buildings on Brownfields Pilot Studies

Previously, in 2002, EPA selected eight communities for Green Buildings on Brownfields pilot projects. Through the Green Buildings on Brownfields Initiative, EPA decided to work with communities, on a pilot basis, to incorporate environmental considerations into the planning, design and implementation of brownfields redevelopment projects.[48] Assistance could be in the form of technical, financial, planning, outreach, design expertise, and/or other needed expertise as identified by the community.[49] Each pilot project received expert-consultant services valued at up to $15,000.[50]

The eight Green Buildings on Brownfields pilot projects included a community center building in Springfield, Massachusetts; the National Aquarium in Baltimore's Center for Aquatic Life and Conservation in Baltimore, Maryland; ReGenesis Medical Center in Spartanburg, South Carolina; the Marina District Redevelopment in Toledo, Ohio; World Headquarters for Heifer International in Little Rock, Arkansas; the Trailnet, Inc. Trailhead Building in St. Louis, Missouri; a Community

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[42] *See* EPA Brownfields Cleanup and Redevelopment webpage, <http://www.epa.gov/brownfields/html-doc/greenbld.htm>
[43] *Id*.
[44] *Id*.
[45] *Id*.
[46] EPA Funds Greener Brownfields Projects news release, July 29, 2008, <http://yosemite.epa.gov/opa/admpress.nsf/e51aa292bac25b0b85257359003d925f/5bb8488345b8985a85257495005dec2d!OpenDocument>
[47] *Id*.
[48] *See* EPA Brownfields Cleanup and Redevelopment webpage, <http://www.epa.gov/brownfields/html-doc/greenbld.htm>
[49] *Id*.
[50] *Id*.

Culture and Commercial Center in Kauai, Hawaii; and the Volcanic Legacy Discovery Center in Mt. Shasta, California.

The Springfield, MA, facility was designed to be a two-story, 25,000 square foot building that would seek LEED® certification and the Energy Star label for buildings. The National Aquarium, which was building a new aquatic animal care center on a 7 acre brownfield site in Baltimore, intended to seek a Gold or Silver LEED® rating. Regenesis, a non-profit organization, was purchasing a 33 acre brownfield site to be redeveloped as a health and wellness park providing integrated healthcare. The Marina District Redevelopment in Toledo, Ohio, involved the redevelopment of a 120 acre brownfield on the banks of the Maumee River. The port authority intended to use energy conservation measures, pedestrian friendly site designs, natural stormwater management, and natural landscaping as part of this project. The Trailhead Building in St. Louis, Missouri, involved the conversion of a former power plant into an environmentally friendly office building. People would be able to learn more about the Greenway, a system of trails being developed by Trailnet, Inc., a non-profit, at this facility as well. The Community Culture and Commercial Center in Kauai, Hawaii, would be built on a site that was used for the illegal disposal of tires, appliances, batteries, automobiles and other types of solid waste. The project intended to seek LEED® certification, using local building materials wherever possible, natural ventilation and day-lighting, and alternative energy generation. Heifer International's world headquarters would be built upon a 28 acre brownfield site in a former industrial area of Little Rock, Arkansas. This 100,000 square foot project would be seeking a Gold LEED® rating. The Volcanic Legacy Discovery Center in Mt. Shasta, California, would be built upon a former 127 acre lumber mill property.

D. Green Building Supplemental Environmental Projects (SEPs)

In an effort to encourage green building throughout the country, the EPA supports green building supplemental environmental projects ("SEPs"), particularly those that support brownfield redevelopment.[51] A SEP is an environmentally beneficial project that a defendant agrees to undertake in settlement of a civil penalty action, but that the defendant is not otherwise required to perform.[52] SEPs must typically be performed on property other than that owned by the defendant. Since many brownfields projects are undertaken by non-profits, community redevelopment corporations, and other units of local government, SEPs may be a useful way to incorporate green building design into the brownfields project.

Generally, a green building SEP would attempt to address one or several sources of pollution generated by a building or construction project.[53] For example, a green building SEP may involve a defendant agreeing to pay for green building strategies at the redevelopment of a contaminated property by a community redevelopment corporation in return for a penalty mitigation credit.[54] The SEP would likely take place on a site not owned by the defendant.[55] The EPA provides the following examples of possible SEPs involving green building: an entity with air violations located near a brownfield redevelopment could purchase energy efficient materials or low VOC emitting materials for the developer; an entity with water violations might construct a greywater recycling system or provide storm water management for a redevelopment project; or a Resource Conservation and

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[51] *See* EPA Memorandum "Supplemental Environmental Projects: Green Building on Contaminated Properties," July 2004, <http://www.epa.gov/compliance/resources/policies/cleanup/brownfields/sep-redev-fs.pdf>

[52] *Id.*

[53] *Id.*

[54] *Id.*

[55] *Id.*

Recovery Act ("RCRA")[56] violator could purchase recycled construction materials or recycle construction demolition waste at the site.[57]

While it is not essential that a green building SEP take place on a contaminated property, this approach is advantageous for several reasons.[58] First, EPA Regions will be more able to identify ideal candidate properties because cleanup will often take place under EPA or state oversight.[59] Second, because EPA or the state will likely be present at the site, interactions with the defendant and site redeveloper will be facilitated.[60] Last, contaminated properties are often a blight on the community, and thus a green building SEP on a contaminated property will provide social and environmental benefits for the community.[61]

Under the EPA's SEP Policy, a green building SEP will generally qualify as an environmental restoration or prevention project, or a pollution prevention project.[62] It is important to note that several guidelines must be followed to ensure that a green building SEP falls within the government's authority. First, there must be an adequate nexus between the violation and the project.[63] Second, the green building SEP may not include an otherwise legally required activity.[64] Generally, a critical SEP concept is that environmental improvements resulting from SEPs would not otherwise have occurred without the settlement incentives provided.[65] Third, a green building SEP may not provide additional resources to support an activity that the federal government is likely to undertake or compel another to undertake.[66] This is not likely to be an issue because EPA's involvement at a contaminated site is focused on environmental assessment and cleanup, while a green building SEP would focus on mitigating the environmental impacts of the development and construction and not the contamination at the site.[67] Lastly, a green building SEP may not provide a federal grantee with additional funds to perform a specific task identified within an assistance agreement.[68] For instance, EPA's brownfields program provides grants for environmental assessment and cleanup and may provide green building technical design assistance through grantees.[69] A green building SEP could not be used to provide

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[56] RCRA is the nation's primary law governing the disposal of solid and hazardous waste. *See* EPA's Wastes webpage, <http://www.epa.gov/epaoswer/osw/laws-reg.htm>

[57] *Id*.

[58] *See* EPA Memorandum "Supplemental Environmental Projects: Green Building on Contaminated Properties," July 2004, <http://www.epa.gov/compliance/resources/policies/cleanup/brownfields/sep-redev-fs.pdf>

[59] *Id*.

[60] *Id*.

[61] *Id*.

[62] *Id*. An environmental restoration or prevention project might involve increasing the energy efficiency of a building, while a pollution prevention project may involve recycling construction debris or using green roofs or pervious parking lots to prevent contaminated storm water runoff. *Id*.

[63] *Id*. The EPA will find that a nexus exists only if one of the following three conditions is met: (1) the project is designed to reduce the likelihood that similar violations will occur in the future; (2) the project reduces the adverse impacts to public health or the environment to which the violation contributes; or (3) the project reduces the overall risk to public health or the environment potentially affected by the violation at issue. *Id*.

[64] *Id*.

[65] *Id*.

[66] *Id*.

[67] *Id*.

[68] *Id*.

[69] *Id*.

additional funds for these design services.[70] In order to avoid potential problems, EPA may inquire about any other federal assistance the owner may be receiving.[71]

III. CONCLUSION

Support for environmental sustainability has grown tremendously over the past several years, and likely will continue to do so. The redevelopment of brownfields sites provides a unique opportunity to utilize numerous "green" concepts. Not only does brownfields redevelopment seek to transform previously-contaminated properties back into useful space, but it also offers the opportunity to showcase sustainable principles in both the remediation and the redevelopment of the brownfields sites. Both national and local policy, as well as the existing LEED® and Green Globes rating systems, provide incentives for locating green buildings on contaminated brownfields sites, and the EPA has recently shown a strong interest in integrating green principles into the remediation process itself. Because of such incentives and a general national concern about environmental sustainability, both the environmental and real estate communities are likely to see a tremendous surge in "green" practices on brownfields sites in the future.

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[70] *Id.*
[71] *Id.*