CITY OF BROOKINGS
COMMON COUNCIL MEETING MINUTES
City Hall Council Chambers
898 Elk Drive, Brookings, OR 97415
November 15, 2004 7:00 p.m.

I. Call to Order

Mayor Bob Hagbom called the meeting to order at 7:00 p.m.

II. Pledge of Allegiance

Led by Boy Scout Alan Freeman

III. Roll Call

Council Present: Mayor Bob Hagbom, Council President Rick Dentino, Councilors Frances Johns Kern, Craig Mickelson, and Larry Anderson. All Council members were in attendance; a quorum was present.

Staff Present: City Manager Leroy Blodgett, City Attorney John Trew, City Planner John Bischoff, Fire Chief William Sharp, and Interim Administrative Secretary Jan Krick

Media Present: *Curry Coastal Pilot* Reporter Brian Bullock

Other: Approximately 30 other citizens

IV. Ceremonies/Appointments/Announcements

A. Ceremonies

1. *Fire Prevention Week Coloring Contest*
   Mayor Bob Hagbom awarded certificates to K-4 grade winners and Police Chief Bill Sharp presented T-shirts.

B. Announcements

2. *Resignation of Commission Ted Freeman*
   Mayor Hagbom announced with regret that Ted Freeman has resigned from the Planning Commission; he no longer lives within the parameters necessary for serving on the commission.

V. Oral Requests and Communications from the Audience

A. *Chamber of Commerce*
Chamber of Commerce President Les Cohen noted that several meetings have passed since he last spoke. In that time, he attended the Pendleton Conference as Treasurer of that organization. The America's Wild Rivers Coast Consortium met for strategic planning for the coming year and to develop their new website; Cohen reported that the Consortium is strong, with all communities in Del Norte and Curry Counties participating. The consortium has

elected new officers. Planning has begun for the Chamber's Business Conference 2005 that will take place on January 5. Dr. John Mitchell of US Bankcorp has agreed to be their keynote speaker. Leadership Brookings Harbor Class of 2005 met in November. The session focused on law and the justice system. Brookings Harbor Chamber has made their trailer available for this year's Nature's Coastal Holiday, for setting up and storing equipment. Cohen noted that the transient room tax collections for October 2004 showed a 28% increase from last year.

B. *Committee and Liaison Reports*

1. Mayor Hagbom said that all Council members and the City Manager attended the LOC Conference in November.

2. Councilors Craig Mickelson and Frances Johns Kern had nothing to report at this meeting. Councilor Anderson attended a meeting of the Harbor Sanitary District on November 9, 2004. Councilor Rick Dentino attended a joint City/School District School Safety Preparedness meeting; participated in LOC; and attended the 11-11-11 Veterans' Memorial Ceremony at the VFW Hall. Ex Officio Councilor Wes Enos reported that the Brookings Harbor High School soccer team made the second round of playoffs, and the football squad will have their first-round game against Wilsonville this Saturday. Winter sports have started; try-outs for spring sports take place soon, Enos reported.

3. Mayor Bob Hagbom reported that the League of Oregon Cities works with lobbyists and legislators, and that 239 members cities were represented at meeting, including Brookings' Mayor-elect Pat Sherman for whom this event was an opportunity to meet new faces and make new friends. Hagbom added that City Manager Leroy Blodgett continues to serve on the LOC Board of Directors.

C. *Unscheduled Address from Audience*

1. Rex Atwell, 17169 Parkview Drive, Brookings addressed Council. He had received a letter from a hospital that is dedicated to children's eye care. He admires the effort and time that this community devotes to charitable contributions such as this one, realizing that eye care is expensive and therefore unavailable to some children. The Elks Club, he reported, has a new motto: "Elks Care, Elks Share." Elks is a nonprofit organization that donates over $100,000 annually for drug awareness, educational

scholarships, Christmas food baskets, impaired speech programs and many other worthwhile projects. The Elks have a request for the City: please consider canceling the city's bed tax, which has cost the Elks $2800 per year. Mayor Hagbom reminded Mr. Atwell that the City has also returned many services to the Elks, such as sidewalks, paving, and additional parking areas at the Elks Lodge; a travel trailer can now stay throughout the year to monitor the vacation homes parked on the Elks Club property. Mayor Hagbom promised, however, that Mr. Atwell's proposal would be discussed further.

2. Susan Lynch, residing at 99544 Northbank, Brookings, reported that the DEQ biosolids report contains inaccuracies, noting particularly on page 2 where DEQ states that health problems have not been identified. She believes that there are health problems, and that citizens want suspension of biosolids applications. She asked that more qualified staff with proper equipment be made available to access the ramifications of the application process. She referred to literature (Exhibit 1) which indicates that the risks of biosolid application can best be assessed by health and medical professionals.

Larry Aslinger, 439 Buena Vista Loop, Brookings, also addressed the application of biosolids by the City's Wastewater Department. His concern was the difficulties the City could encounter in defending against a health-related suit as a result of the spreading of biosolids on land near our water source. Studies indicate more research is needed to find if it is really safe, according to Aslinger. He presented Biosolid B Sludge information (Exhibit 2).

VI. Staff Reports

A. *City Manager*

1. Biosolids Update

City Manager Leroy Blodgett presented, and read from, information obtained from DEQ describing the Ranney collector, as well as information about the specific land application of biosolids at Smith Ranch. He reminded concerned citizens that Representative Krieger requested a meeting on this topic on September 29, 2004, after which DEQ was to review the situation. Their review indicated that there has only been one violation of the permit to spread biosolids over the past two years, and the violation did not result in any health concerns. The City is currently

studying the possibility of alternative application sites, and exploring the possibility of composting. The application of biosolids has been suspended since October 31, 2004.

DEQ's Michael H. Kortenhof reported that the City accesses a safe and stable water supply; further information will be brought to Council as it is discovered.

Councilor Anderson asked when additional regulations would apply; Blodgett replied that nothing would be altered until the application season resumes in March of 2005.

Larry Aslinger, 439 Buena Vista Loop, Brookings returned to the podium to speak about application sites other than the Smith Ranch.

Blodgett said that he has spoken with city officials in Crescent City, who reported that their garbage collection service does use the Winchuck area for biosolid applications similar to ours. Aslinger replied that Brookings might want to investigate other areas, stating that he is concerned with contaminants near the Brookings drinking water supply.

City Manager Blodgett responded that in the past 28 years we have not had any contamination.

Susan Lynch, 99544 Northbank, Brookings, returned to the podium asking the City to continue to search for more answers to the indicators that the health of the community is at risk.

The City Manager responded that the City's drinking water is tested on a weekly basis, and that we will be glad to show concerned citizens that data. Susan Lynch replied that she is concerned with both the water supply and airborne contaminants.

No recommendation in response to the staff report was made at this time.

2. Burning Ban Exception
City Manager Leroy Blodgett alerted Council that, at the October 25, 2004, City Council meeting wherein Council adopted a policy to ban commercial burning in the City of Brookings, Council overlooked some of the implications of

that regulation. City Manager Blodgett advised that the City itself burns brush and wood debris from its streets and parks, and that alternative methods for removing wood debris are being examined at this time.

Another implication that was not considered at that time is burning at Harris Beach, both in campfires and during clearing operations. The question arose whether or not that should be considered commercial or private burning. Since the State Park is so large, the situation does present some questions, particularly whether or not City Council should exempt state parks from the City's burning ban. Dave Neighbor from Harris Beach State Park will present information tonight and ask City Council to exempt the state parks from the commercial burning ban.

Councilor Rick Dentino asked for clarification: what would happen if another representative from the State Parks Department wants to burn debris; would that operation also be exempt?

City Manager Blodgett replied that garbage burning is not exempt from the ban.

Councilor Dentino asked if this would require the City to police the Park to see what is being burned.

City Manager Blodgett responded that lifting the ban in this exception would not alter the situation that existed before the ban; we would just allow the previous operations at Harris Beach State Park to continue.

Councilor Larry Anderson stated that, though he understands the request, he would like to remind Council that implementation of the new policy has caused a financial burden for many people who used to burn, including himself, and commented that this is the time for leadership to step forward. Some developers have sought methods to get rid of stumps and other debris and CTR is benefiting drastically from the ban. The campfire burning exemption seems reasonable, but changes in procedures affect us all—we may need to invest in grinders, mulchers, etc., and this is an opportunity to set an example by the City and state parks and other government entities that says let's all bleed together to keep air quality high. To exempt campsite burning seems okay, but Councilor Anderson

remarked that he is hesitant to extend it to brush burning (either by the parks or by the City).

Councilor Craig Mickelson agreed with Councilor Anderson, and recommended approving campfire burning only.

Dave Neighbor, 96659 W Harris Heights Road, addressed Council, confirming that Harris State Park is one of largest land bases in Brookings. Volunteers work, as well as staff, picking up trimmings that are burned only twice per year – in the fall and spring. A chipper is used to chip what they can, but the Park staff must hand peel bark or burn it for eradication of beetles. We are conscientious, he added, and the financial concerns implicit in this ban add to an already stressed budget. Neighbor will look into a machine, but reminds Council that the noise produced disturbs the tranquility of the park.

Councilor Anderson made the motion and it was seconded that the State Park facility at Harris Beach be allowed to continue the current campsite burning policy; however the exemption to the burning ban would not extend to include burning of brush generated by Park cleanup.

3. Quitclaim Approval
Council was asked by City Planner John Bischoff to consider a quitclaim deed pertaining to the property at the northeast corner of Seventh Street at Meadow Lane adjacent to the northerly City limits, as described in Planner Bischoff's Staff Report in this evening's agenda. An error in a survey done several years ago resulted in a 10 foot gap beyond the required 50 foot right of way. To resolve any confusion over the existence and ownership of the gap, Staff is asking for approval of a quitclaim deed to transfer the City's interest to Terravita Development, Inc.

Councilor Craig Mickelson made the motion, and it was seconded, to follow Staff's recommendation that the quitclaim deed be approved. The motion carried.

VII. Executive Session [Pursuant to ORS 192.660(2)(h)

At 8:05 p.m., the Common Council recessed to convene in an Executive Session to discuss the rights and duties of a public body as outlined in ORS 192.660(2)(h).

The Executive Session adjourned at 9:03 p.m., after which the City Manager requested a 5 minute break.

The Regular Common Council meeting reconvened at 9:07 p.m.

City Attorney John Trew reported that the Council had met in an Executive Session per ORS 192.660(2)(h) which states that Council may meet in an executive session with legal counsel. This action is intended to put public bodies on equal footing with private litigants, so that legal counsel may advise Councilors of the legal ramifications of any legal actions they might take.

City Attorney Trew explained the two issues that were discussed in Executive Session:

1) On November 12, 2004 the City received a letter dated November 5, 2004 stating that the Cascade Advocacy Group representing several citizens participating in the Lone Ranch development process have filed a notice to appeal to LUBA the decision by Council to approve the Borax project at Lone Ranch.

2) A lawsuit filed by Bruce Brothers LLC against the City including a Writ of Mandamus.

   ORS 192.660(2)(h) requires a limitation on an executive session that Council may not make any final decision during that executive session. Therefore, based upon advice given in Executive Session tonight, Council is prepared to make a motion at this time.

   Councilor Craig Mickelson made a motion, and it was seconded, for City Attorney John Trew to instruct staff to attempt negotiations with Bruce Brothers LLC to settle the Writ of Mandamus. If negotiations are not successful, the City attorney is directed to prepare and file documents to defend the City against the Writ.

   City Manger Leroy Blodgett advised further that a decision on the Measure 37 item needs to be made before December 2 as we had been given 30 days to adopt policy before an ordinance is required. This gives the City Council time to discuss the issues and bring information back to this body.

   Following discussion by the Councilors, a motion was made to schedule two additional Council meetings, one on November 22, and a second on November 30, 2004.

John Trew will research ordinances that have been adopted in other areas with regard to Measure 37 before the November 30 meeting, reminding Council that we are not required to have the ordinance in place by December 2, 2004, advising that we have something in place, however, before Measure 37 goes into effect.

Councilor Larry Anderson made a motion, and it was seconded, to schedule two additional City Council meetings, on November 22, 2004, and November 30, 2004, starting at 7 p.m. in this Chamber. The motion carried.

VIII. Consent Calendar

A. *Approval of Council Meeting Minutes - October 25, 2004*
B. *Acceptance of Parks and Recreation Commission Meeting Minutes - September 23, 2004*
C. *Acceptance of Planning Commission Meeting Minutes – Regular Meeting October 5, 2004 and Special Meeting Continuation October 19, 2004*
D. *Minutes of Downtown Development Subcommittee Meeting – November 10, 2004 will be offered for Approval at the December 13, 2004 Regular Council Meeting*
E. *Approval of Vouchers for t he Month of October, 2004 ($382,864.13)*
F. *Acceptance of Building Department Activities Summary – October 2004*

Items on the Consent Calendar were approved by a motion by Councilor Frances Johns Kern and seconded. The motion carried.

IX. Ordinances/Resolutions/Final Orders

A. *Final Orders*
   1. No action was taken regarding Final Orders pursuant to Ransom Creek (PUD-2-04).

   2. Final Orders for the Woosley Variance (VAR-3-04) were addressed and Staff recommended that Final Orders be approved by Council.

   Councilor Craig Mickelson moved to accept Staff Recommendation and approve the Final Orders on the Woosley Variance (VAR-3-04), and it was seconded. The motion carried.

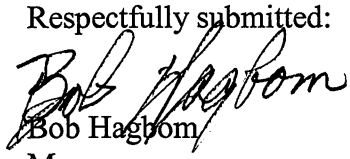
X. Remarks from Mayor and Councilors

1. There were no further remarks from the Mayor
2. There were no further remarks from the City Council

XI. Adjournment

With no further business before it, the Council adjourned the meeting at 9:20 p.m.

Respectfully submitted:



Bob Hagbom
Mayor

ATTEST by City Recorder this ____ day of _____, 2004.

_____
Paul Hughes
Finance Director/City Recorder

EXHIBIT 1
Received 11-15-04
@ CC mtg.

RE: City of Brookings - Land application of biosolids at the Smith Ranch

Dear «Title» «Last»:

This is to provide you an update on our review of the compliance data regarding the land application of biosolids from the City of Brookings wastewater treatment plant at the Smith Ranch, near the Chetco River. The review was done as follow up to the meeting held in Brookings on September 29 at Representative Kreiger's request. We are sending this letter to all the people who gave us their name at the meeting or signed the petition to the City of Brookings that was circulating. A mailing list is enclosed.

Permit Compliance
We have visited the City's five active land application sites and reviewed the site logs from 2003 and 2004. We found one permit violation. Biosolids were applied in April of 2004, earlier than authorized, and are issuing a Notice of Noncompliance to the City. The weather conditions and loading rates were such that this violation is not considered to have any environmental impact but the City is subject to penalties in the future if repeated violations occur.

Regarding the concerns that septic tank wastes ("septage") have been applied at the Smith Ranch, because the City uses Roto Rooter to transport their biosolids and Roto Rooter also transports septage to other approved locations, there is potential for loads to be mixed. Based on our observations from this review, earlier inspections, and review of Roto Rooter septage disposal records, we have found nothing to indicate that biosolids and septage have been mixed. We do consider the City's operation to be well run but because we are usually not present when biosolids are applied, we depend on complaints to identify problems that may occur. If you have additional reason to believe there are violations or environmental problems occurring, please contact us and provide as much detail as you can so we can investigate. Work on biosolids issues in this area is handled by Paul Kennedy. He can be reached in DEQ's Roseburg office at 541-440-3338 x228.

Threat to the Chetco River and the City's Drinking Water Supply
We have also coordinated with the Department of Human Services about the City's water supply intake. We have determined that the well head protection zone does not extend to Mr. Smith's property. A copy of the map is enclosed. Additionally the City of Brookings has not had detections of metals in their well. Data is available since 1986 and it appears that Brookings has a very safe and stable water supply. The Department of Human Services web link for this information is: http://170.104.158.16/inventory.php3?pwsno=00149

In our discussions on September 29 there were suggestions made that specific monitoring be performed to further evaluate the issues that have been raised. With our comments above in mind, DEQ does not feel we have the basis to require the City to perform more monitoring than is already required in the permit, nor are there DEQ funds or staff available to do it ourselves.

Continuing Issues
We believe past activities have been, with one exception, conducted in compliance with our rules. Importantly, we have not identified any environmental or human health problems associated with the application of biosolids at the Smith property. At this time, we have no basis for changing the land application approvals. We know that some of the concerns raised are the subject of ongoing discussions on a national level about the appropriateness of land application of biosolids, but the rules authorizing these activities were developed in a deliberative, scientific process and new information and policy making will be needed to change them if appropriate. To do otherwise would be an arbitrary action by DEQ. Nonetheless we recognize that there still could be other local issues involving the City's municipal operations and land use choices that could lead to changes for other reasons. DEQ recognizes that we would be directly involved if changes are made and are willing to participate in further consideration of the issues that the City or County may be interested in pursuing. Leroy Blodgett, City Manager, has indicated that he would be briefing the Mayor and City Council on the issues and DEQ is willing to provide assistance as may be helpful.

I hope this clearly describes DEQ's comments on the issues that have been raised. If you have any questions please feel free to call me at (503) 378-8240 x267 or (800) 379-7677.

Sincerely,

Michael H. Kortenhof
Manager
Western Region Water Quality Permits

NEW SOLUTIONS, Vol. 12(4) 387-408, 2002

Features

INVESTIGATION OF ALLEGED HEALTH INCIDENTS ASSOCIATED WITH LAND APPLICATION OF SEWAGE SLUDGES

ELLEN Z. HARRISON
SUMMER RAYNE OAKES

ABSTRACT

The majority of U.S. sewage sludges are disposed by application to land for use as a soil amendment. Class B sludges, containing a complex mix of chemical and biological contaminants, comprise the majority. Residents near land application sites report illness. Symptoms of more than 328 people involved in 39 incidents in 15 states are described. Investigation and tracking of the incidents by agencies is poor. Only one of 10 EPA regions provided substantial information on the incidents in their region. Investigations, when conducted, focused on compliance with regulations. No substantial health-related investigations were conducted by federal, state, or local officials. A system for tracking and investigation is needed. Analysis of the limited data suggests that surface-applied Class B sludges present the greatest risk and should be eliminated. However, even under less risky application scenarios, the potential for off-site movement of chemicals, pathogens, and biological agents suggests that their use should be eliminated.

OBJECTIVE

We conducted investigations into the numerous incidents in which residents living near sites where sewage sludges are land applied have reported illness. We compiled information about the health complaints. In order to find out what tracking and investigations had been carried out by the responsible authorities, we sought any information that federal and state agencies had about these incidents. Information regarding the sludge management practices associated with the

incidents could be used to determine whether there are practices posing particularly high risk.

WHAT'S IN A NAME

Sewage sludges are a "viscous, semisolid mixture of bacteria and virus-laden organic matter, toxic metals, synthetic organic chemicals, and settled solids removed from domestic and industrial wastewater at sewage treatment plants" [1]. Wastewater from three-quarters of American households [2] flows into the 16,000 municipal wastewater treatment plants (WWTPs) in the United States [3]. The flow into WWTPs includes not only domestic sewage, but many other wastes. Wastewater from businesses and industries enters the sewer system, as does street runoff in many communities. Leachates from landfills, Superfund sites, and other industrial clean-up projects are often directed to WWTPs.

The role of WWTPs is to treat the influent wastewater to produce a water effluent that meets standards established under the Clean Water Act (CWA). Treatment processes include settling to remove solids (primary treatment) which is generally followed by a biological process that reduces the organic matter content and hence the oxygen-depleting potential of the wastewater (secondary treatment). Further treatment (tertiary treatment) is occasionally required to reduce a particular pollutant such as phosphorus. Sewage sludges are the byproducts of these processes. They are what remains after the treatment processes have cleaned the water to acceptable levels.

As the degree of treatment of wastewater has increased over the years, so has the amount of sludge. In 1998, the United States generated an estimated 6.9 million tons (dry weight) of sewage sludges and that is projected to increase to 8.2 million tons by 2010 [4]. For many years sewage sludges in coastal communities were dumped in the ocean. That practice became illegal in the early 1990s. Today, primary options for sludge disposal include landfilling, incineration and land application (use as a soil amendment for crops or land reclamation). Generally the least-cost option, land application has become the most prevalent disposal method in the United States [5].

Sewage sludges contain nutrients (nitrogen and phosphorus) and organic matter. But they also contain pathogens and contaminants. Before land application, sludges must be treated to reduce pathogens. They are not, however, treated to reduce other contaminants. Sewage sludges that meet standards for land application have been sanitized by the industry and EPA by referring to them as "biosolids" [6].

THE REGULATORY FRAMEWORK

The disposition of sewage sludges is regulated under the federal Clean Water Act. Rules promulgated in 1993 regulate land application (CFR40 Part 503,

hereinafter "Part 503"). Standards based on human health and agricultural productivity are set for nine elements (arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc) and technology-based standards are set for pathogens and vector-attraction reduction. Sludges that are treated to reduce but not eliminate pathogens are called Class B. Those that are treated with a goal of pathogen elimination are called Class A. A few site restrictions are established for Class B sludges under federal rules. Class A sludges that meet the EPA standards for nine elements and vector-attraction reduction may be distributed without restriction and without labeling as to their origin or pollutant content.

These federal standards provide minimum standards and states may adopt stricter rules. Municipalities also may regulate land application and the scope of municipal authority varies from state to state [7].

The Part 503 rules are "self-implementing," which means that EPA does not review and permit land application, but rather requires the regulated entity to follow the rules and keep documentation of compliance. Some periodic testing of sludges is required for nitrogen, nine elements, and in some cases indicator pathogens. The required frequency of testing varies from once a month to once a year depending on the size of the WWTP.

Standards for the land application of sewage sludges vary from country to country in Europe, but are generally far more stringent in northern Europe than in the United States [8]. And unlike in the United States, a number of organic chemicals in European sludges are regulated [9]. The differences are due to different approaches to environmental protection and risk assessment.

The United States establishes standards based on a risk assessment approach, where standards may vary substantially depending on target organisms and the numerous assumptions made in calculating risks [10]. Rather than risk assessment, a number of European countries utilize a precautionary approach, setting standards based on non-degradation of soils. They also limit the frequency and quantity of land application of sludges.

REPORTS OF ILLNESS

Many of the risks to people, agriculture, and the environment posed by land application of sewage sludges are chronic and may only be evident after long-term exposure. Such effects are difficult to measure and document. In the last several years, however, illnesses have been reported by residents living near sludge land application sites in a variety of locations. Anecdotal evidence of illness among neighbors to Class B sludge land application sites is mounting [11]. New sites at which people are complaining of illness are being reported approximately monthly. Allegations range from headaches and respiratory problems to death.

Table 1 describes 39 incidents in 15 states affecting more than 328 people. These are complaints the authors were aware of as of July, 2002. The sources of information in Tables 1 and 2 are from newspaper accounts, reports from state agencies, or from the affected individuals. It has not been confirmed by scientific investigation that these persons became ill due to land application of sludges. Estimates of the number of individuals affected (Table 1) are low because numerous accounts indicated that many people were ill. When specific numbers were not provided, such incidents were counted as the minimum number possible (two individuals). We attempted to eliminate incidents that may have been associated with practices other than land application of sludges (composting facilities, for example), but were unable to confirm that land application of sewage sludge took place at all the locations in Table 1.

There is a set of symptoms that are common among neighbors to the sludge land application sites we investigated. Most common are respiratory and gastro-intestinal symptoms, skin disorders and headaches. Other symptoms frequently reported by numerous people include nosebleeds, burning eyes, throat or nose, flu-like symptoms, and fatigue (Table 1). Among those affected, these symptoms are known as "sludge syndrome." Such symptoms might be caused by exposure to irritating chemicals such as ammonia and organic amines, endotoxins, and pathogens.

Medical providers are unfamiliar with the sludge exposure and are thus unlikely to consider an association between a patient's symptoms and sludge. In addition, people living near sludge application sites know little or nothing about the material and are often economically disadvantaged, with few resources to devote to investigation or medical care. For example, it was five years after a child in Pennsylvania, Tony Behun, died of an infection after riding his motorbike through Class B sludge that his parents learned about sewage sludges and came to believe that his death was due to the sludge exposure. The increasing number of reported incidents may reflect the growing awareness of the issue in communities across the country and in Canada.

POTENTIAL EXPOSURE

There are many gaps in the scientific basis of the land application rules [12]. Two potential routes of exposure of residents to chemicals, endotoxins (microbial byproducts), and pathogens are of particular concern and have not been considered under current rules. Airborne transport of particles blown from application sites onto nearby properties appears to present a potentially significant source of exposure [13]. A modeling study conducted in the arid southwest indicated that risks to persons living within 100 meters of the application site exposed for 8 hours under average wind conditions would be predicted to have a 94 percent chance of viral infection [14]. Risks varied with distance from the site, duration of exposure and wind velocity (Table 3). It is likely that in

more humid, cooler areas risks would be even greater due to higher rates of pathogen survival.

Water runoff from land application sites presents another route for off-site exposure to the chemicals and pathogens in the land-applied sludge. Federal rules do not require any setback from homes or neighboring property. They also allow sludges to be applied to the surface of the soil without incorporation. Surface application would likely increase the potential for off-site transport via runoff.

Complicating the picture is that sludges contain a mixture of pathogens and chemicals. There is some evidence that the simultaneous exposure to some chemical irritants and endotoxins in sludges may increase the risk of infection from exposure to pathogens [15]. Irritation of mucous membranes and other tissues by airborne chemicals and endotoxins emitted from sludges may predispose people to infection by providing a port of entry for pathogens.

FEDERAL AND STATE AGENCY RESPONSE

In the spring of 2002, we conducted research into the alleged health incidents listed in Table 1. Making use of anecdotal reports [16], we attempted to compile information about each incident. Using e-mail, we contacted the biosolids coordinator in each of the 10 EPA regional offices and also the biosolids coordinators in 14 states in which an incident was reported [17]. We requested the opportunity to talk with them or to receive reports regarding the incidents, any investigation of the health complaints, and information they had about the type of sludge applied and management practices at the site.

Table 4 shows the responses received from EPA more than two months after the inquiry. Only one of the 10 regions provided detailed responses. Four did not reply. Two asked that we file Freedom of Information (FOI) requests. Three provided no information but directed us to state agencies [18].

EPA resources devoted to the biosolids program are inadequate [19] which may partly explain the results shown in Table 4. The U.S. EPA Office of the Inspector General investigated the EPA biosolids program in 2000 and again in 2002. In 2000, it found that the staff level for the biosolids program was inadequate to ensure compliance with land application requirements [20]. In 2002, it found that staffing levels had in fact declined in the intervening two years [21]. More EPA resources are needed [22].

In addition to contacting regional EPA offices, state biosolids coordinators in the 14 states identified in Table 5 were contacted by e-mail in the spring of 2002. Table 5 shows the responses received. Nine provided information, five did not respond, and three were unaware of the incident in their state.

At the federal level there is no national tracking system for complaints related to sewage sludges [23]. Citizens are often unsure of how and to whom they should report complaints about land application. In talking with complainants, some of whom had a record of having contacted state or federal biosolids staff, we found

Table 1. Alleged Health Incidents Associated with Land Application of Sewage Sludges

Location of incident	State	Number affected	Symptoms																					Miscellaneous complaints
			A	B	C	D	E	F	G	H	I	L	M	N	P	R	S	T	V	W	X	Y	Z	
Grand Bay	AL	>15	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	*e. coli* poisoning, muscle bone-joint aches, thyroid problems, growths on eyes, mouth, and tongue sores, sore throat, bronchitis, tonsillitis, pneumonia
Corona (Riverside County)*	CA	37 +				X	X		X	X			X	X	X	X			X			X		
Menifee (Riverside County)	CA	100 +	X			X			X	X	X		X	X	X	X	X	X	X				X	Dehydration, seizures, ear infections, pneumonococcal and staphylococcus infections; mouth, nose, and throat blisters; blisters on fingers and toes
Riverside County (general)	CA	##	X			X		X	X	X					X	X	X							Blood infections, fungus in lungs, sore throats
Solano County	CA	##														X								
Winchester (Riverside County)	CA	~ 6				X			X	X		X	X	X	X	X	X					X	X	*Helicobacter pylori* bacterial disease, seizures, throat blisters
Desoto County	FL	> 24	X		X	X	X	X	X	X	X		X	X	X	X	X		X		X	X		Bacterial ear infections, heart palpitations, rotavirus, bronchitis, fever, mastoid infection, sinusitis, pneumonia, pleurisy

Laurel Hills (Okaloosa County)*	FL	2																		*Blastocystitis hominis* intestinal parasites
Polk County*	FL	4			X			X	X			X	X		X	X	X			
Sarasota	FL	##	X			X	X		X		X			X					X	Sore throat
Davenport*	IA	##																		Cancer clusters, non-hodgkins lymphoma
Prole*	IA	##	X				X							X		X				
Brandywine	MD	~ 3					X		X		X	X		X				X	X	
Unity*	ME	3						X	X								X			X Hair loss, nose sores
Sparta*	MO	2								X										Blood contaminants
Canaan*	NH	1																		Numbness of limbs
Greenland	NH	20 +	X		X				X		X	X	X	X		X	X			Death, pleurisy
Manchester	NH	##					X					X		X			X		X	
Elkton*	OH	1 +					X					X				X	X		X	X
Germantown*	OH	8	X						X	X	X	X		X					X	X
Warren*	OH	1						X	X	X		X		X						
Waynesville*	OH	2				X		X	X		X	X		X					X	Palpitations

Table 1. (Cont'd.)

Location of incident	State	Number affected	Symptoms																					Miscellaneous complaints
			A	B	C	D	E	F	G	H	I	L	M	N	P	R	S	T	V	W	X	Y	Z	
Xenia*	OH	1 +														X					X			
Lehartsville; Berks County	PA	2																						Boils, severe pain on right side, heart irregularities
Robesonia, Heidelberg Township; Berks County	PA	4				X						X				X								Death, sore throat, viral/staphylococcal pneumonia
Osceola Mills; Rush Township; Centre County	PA	9					X	X	X	X		X	X	X		X			X					Death, dizziness, fever, numbness, sore throats
Point Marion; Diliner	PA	##					X		X	X			X	X		X			X		X	X	X	Chest pains, itchiness, sinus problems
Snoe Shoe & Clarence; Snow Shoe Township; Centre County	PA	1				X				X				X									X	
Upper Mt. Bethel Township*	PA	##																						NA
Ridgetop*	TN	##																						Strokes, lung malformations

Fort Bend County*	TX	4							X			X		X								
Sierra Blanca; Hudspeth County	TX	##	X				X								X							Mouth blisters
Bumpass	VA	4 +	X			X		X	X					X		X						Pruritus
Culpepper	VA	~ 7	X	X	X		X	X	X	X		X	X		X				X		X	
Cumberland	VA	##	X		X	X		X	X	X												
Loundon County	VA	~ 37	X		X	X	X		X		X	X	X	X	X	X		X			X	Pneumonia, cardiomyopathy
Toms Brook	VA	##	X		X	X									X							
Lynden	WA	4								X												*Blastocystitis hominis*, mycoplasma pneumonia, nickel toxicitythyroid problems
Whitewater; Walworth County*	WI	2				X			X				X			X					X	Nose scabs
TOTAL > > > 328																						

Note: * = Not confirmed if land-application of sludge took place. ## = Unknown number of victims (considered 2 (two) victims for counting purposes).

(*See next page for Key to Symptoms*)

Key to Symptoms in Table 1

Symbol	Symptom description	Symbol	Symptom description
A	Allergies, asthma	N	Nausea
B	Birth complications (i.e., premature birth, congenital defects)	P	Nosebleeds
C	Cysts, abscesses	R	Respiratory complications, difficulty breathing
D	Dry heaves/coughing	S	Skin rashes
E	Eye problems (i.e., burning eyes, tearing eyes)	T	Tumors
F	Flu-like symptoms	V	Vomiting
G	Gastrointestinal complications, stomach cramping	W	Weight loss
H	Headaches	X	Burning throat
I	Immunodeficiency problems	Y	Burning nose
L	Lesions	Z	Fatigue
M	Mucous		

numerous examples in which the agencies had no record of the complaints. A system for tracking complaints is clearly needed [24]. Two of the states we contacted and who responded to our inquiry, New Hampshire and Virginia, have established a tracking system for complaints related to sludge application.

Our research failed to find any substantial investigation of alleged health incidents by federal, state, or local officials. A recent report by the National Academy of Sciences also failed to find any documented scientific studies [25]. Meanwhile, the Canadian Infectious Diseases Society (CIDS) called for a moratorium on the spreading of sewage sludges [26]. It based this action on concerns about the potential for pathogens to survive and remain pathogenic and the lack of sufficient data to ensure protection of humans from disease.

Those responsible for regulation of land application of sludges at both the federal and state level are not properly equipped to conduct health-related investigations. When complaints were investigated, agency investigations focused on whether there had been violations of the relevant regulations, such as whether setback requirements were followed [27]. Qualified experts at the federal and state level, such as those at the Center for Disease Control and Prevention or at state health departments, have not thus far been engaged in any scientific investigation of the incidents involving exposure of residents. Local health departments are sometimes involved, but do not generally possess the necessary experience and expertise.

Agency reports regarding these incidents, when available, are often compromised by misunderstandings, lack of data, or a significant time interval between the illness and the investigation. For example, in the Osceola Mills, Pennsylvania case that involved the death of an 11-year-old child who rode his motorbike through sludge at a mine reclamation site, the Pennsylvania Department of Health "did not conduct an investigation into Tony Behun's death" [28]. Any investigation would have been hampered by the fact that several years had elapsed between the death and the possible attribution to contact with sludge. In another example, one of the more thorough local health department reports states that "(S)tudies have consistently shown that once biosolids have been applied and been allowed to dry, pathogens contained in them are not transported by air" [29]. No citation is given. However, the National Academy of Sciences found that the potential for off-site transport of bioaerosols containing pathogens is a potentially important and unevaluated pathway of exposure [30].

The single published investigation of health incidents related to land application of sludges determined that at the 10 sites investigated, coughing, burning throat, burning eyes and headaches were the most common symptoms experienced within an hour of exposure. Difficulty breathing, nausea and vomiting, fatigue and flu-like symptoms were reported within 24 hours of exposure. Infections of the skin and respiratory tract with *Staphylococcus aureus* were prevalent [31]. *Staphylococcus* are a common bacteria found in sludges [32], in the human gut, and in the environment.

Table 2. Sludge Management Practices at Sites of Alleged Health Incidents

Incident**	State	Sludge type	Land use	Spreading process	Stockpiled	Notes
Grand Bay	AL	B	Agriculture	Surface-applied	No	
Riverside County	CA	Many B sources, some failed to meet Class B pathogen reduction requirements, some anaerobically digested, some aerobically digested	Agriculture	Disced in	No Class B Yes Class A and manure	Spread daily Violations of Class B standards for some land-applied sludges
Solano County	CA	B, anaerobically digested	Agriculture	Surface-applied	Yes	
Desoto County	FL	B, lime-stabilized	Agriculture			
Sarasota County	FL	B	Agriculture	Surface-applied liquid; disced in cake	Yes	
Brandywine	MD	B, lime-stabilized sludge	Mine reclamation	Disced in	No	Strong odor Up to 46 drytons/ac applied to 78 acres over 3 months
Greenland	NH	B, lime-stabilized sludge	Agriculture	Top-dressed and chain-harrowed (dragged)	Yes	
Manchester	NH	Class A compost	Compost storage		Yes	Unstable malodorous compost
Lehartsville	PA	B, cake	Agriculture	Surface-applied		

Table 2. (Cont'd.)

Incident**	State	Sludge type	Land use	Spreading process	Stockpiled	Notes
Robesonia	PA	B, lime-stabilized, dewatered cake	Agriculture			300 acres, applied 5x/wk, ~1400dry T/yr violations noted in 1988 and 90 (spread on frozen ground, stock-piled, not incorporated)
Osceola Mills	PA	B, lime-stabilized cake	Mine reclamation			11-yr-old rode motorbike through sludge; 60 dry T/acre
Port Marion	PA	B				
Snowshoe	PA	B, lime-stabilized				City of Philadelphia cited by PA DEP for malodors
Sierra Blanca	TX	B				
Bumpass	VA	B, lime-stabilized, one anaerobically digested		Cake biosolids surface-applied	No	
Culpepper	VA	B, lime-stabilized, one anaerobically digested		Cake biosolids surface-applied	No	
Cumberland	VA	B				
Loundon County	VA	B		Surface-applied		
Tom's Brook	VA	1.5% sludge			No	Mix of food processing wastes and sludge
Lynden	WA	B, aerobically-digested				

Table 3. Predicted Percent Chance of Viral Infection Resulting from Exposure to Land-Applied Sludges (after Dowd et al. [14])

	Distance from sludge source	
Hours exposed	100 m (328 ft.)	500 m (1640 ft.)
Wind speed of 20 m/sec (45 mi/hr)		
1 hr	91%	61%
8 hr	100%	100%
24 hr	100%	100%
Wind speed of 10 m/sec (22 mi/hr)		
1 hr	60%	21%
8 hr	99%	85%
24 hr	100%	100%
Wind speed of 5 m/sec (11 mi/hr)—U.S. average		
1 hr	29%	0.3%
8 hr	94%	22%
24 hr	100%	52%
Wind speed of 2 m/sec (4 mi/hr)		
1 hr	6%	0.02%
8 hr	40%	0.2%
24 hr	78%	0.6%

Compliance with the regulations does not ensure protection of public health. In one of only two incidents that did not involve Class B sludges, composted sewage sludge was stockpiled adjacent to a school, the state biosolids coordinator investigated claims of nausea and vomiting. He found that the compost was still biologically active and undergoing rapid decomposition, resulting in strong odors. He concluded that this stockpiled sludge compost was the cause of the symptoms experienced by some children. He also noted that there were no violations of sludge management rules [33].

There has been no systematic collection of data regarding management practices or sludge characteristics at the sites where health allegations have been made. Table 2 shows the information we were able to gather from our research. Sources of information included site neighbors and federal, state, and local agencies. Most of the incidents are associated with surface application of sludges, which is a legal practice in most localities.

Table 4. Response of USEPA Regional Biosolids Staff to Inquiry Regarding Incidents (as of July 24, 2002)

EPA Region	Responded	Did not respond	Suggested contacting state biosolid coordinators for information	Required Freedom of Information Act letter for further information
Region 1		X		
Region 2				X
Region 3			X	
Region 4				X
Region 5			X	
Region 6		X		
Region 7		X		
Region 8		X		
Region 9	X			
Region 10			X	

OVERSIGHT

It has been noted that EPA resources devoted to the biosolids program are inadequate [34], which may partly explain the results shown in Table 4. The EPA Office of the Inspector General found that "EPA does not have an effective program for ensuring compliance with the land application requirements of Part 503. Accordingly, while EPA promotes land application, EPA cannot assure the public that current land application practices are protective of human health and the environment" [35]. This statement was made in the report published in 2000 based on the EPA staffing level of 18 people in 1998. Staffing levels continued to decline. In 2000, EPA had only 10 staff devoted to regulation and oversight of sludge [36]. EPA has also failed to invest in the research it committed to when the Part 503 rules were promulgated. At that time the Office of Research and Development within EPA recognized significant knowledge gaps which are described in the preamble to the rule [37].

Our review of required compliance monitoring data for several WWTPs in New York State that land apply their sludges showed that there was no effective internal review of those data. Laboratory and reporting errors were evident. Decimal point errors were evident for several contaminants and the same value was repeated for several contaminants. In addition, reported values for lead,

Table 5. Response of State Agency Biosolids Staff to Inquiry Regarding Incidents (as of July 24, 2002)

State	Responded	No response	Responded to inquiry but not aware of incident
AL			X
FL		X	
IA		X	
MD	X		
ME	X		
NC	X		
NH	X		
OH			X
PA	X		
TN		X	
TX		X	
VA	X		
WA	X		
WI	X		

for example, were unrealistically low, below levels reported elsewhere in any sludges. There is thus little confidence regarding the quality of the sludges applied or of the ability to detect and prevent violations.

EPA has suggested that, given their limited resources, sewage sludges are low risk and thus low priority as compared to, for example, hazardous wastes. It is difficult to compare these two materials, though both have toxic constituents. The risk may be relative to exposure. In contrast to hazardous wastes that are managed in highly engineered systems, sewage sludges may be spread on land including farms and home gardens used for food production or on recreational areas. They are spread on lands immediately adjacent to residences, schools, and nursing homes.

Another rationale used to suggest the low risk posed by sewage sludges is that only a small proportion of agricultural lands in the United States receive sludge application. However, the distribution of farmland and sludge generation is not uniform across the United States. Sludges from densely populated regions are routinely exported to rural areas. Export is controversial, often generating opposition in the receiving locality and leading to adoption of local restrictive ordinances.

PATHOGENS AND ODORS

Sludges contain an array of pathogens including bacteria, viruses, protozoa, and parasitic worms derived from the input of the population contributing wastes to the WWTPs [38]. Required testing of sludges for pathogens is very limited and is based on the concept of "indicator" organisms. Indicator organisms, specifically fecal coliforms, *Salmonella* and *Ascaris,* are used to determine the hygienic status of sludges. The concept of using one or several pathogens to provide an indication of the effectiveness of treatment in reducing all pathogens is worthwhile since it is impractical to test for all of the potential sludge-borne pathogens. However, there are serious limitations in using these indicators and there is a need to develop protocols for alternative indicators [39].

Alternative indicator organisms have been suggested for more than twenty years [40]. There is also recognition that the detection of various pathogens in sludges is highly variable both among sludges and over time for sludge generated at a single treatment plant [41]. A new survey of pathogens in sludges is needed [42].

Treatment is required before sewage sludges can be land applied, but the majority of sludges used on agricultural land and in reclamation of mined lands are Class B sludges that still contain detectable pathogen loads [43]. Workers applying the sludges [44] and neighbors to land application sites may be exposed to pathogens through several pathways including direct contact on the site, sludge runoff, infiltration into groundwater and wells, and airborne transport off-site [45].

Odors are the most frequent cause of complaints surrounding land application. Until recently, odors have been dismissed as a purely esthetic or quality-of-life issue. However, there is evidence that exposure to odor-causing chemicals can cause illness and that some airborne contaminants can cause a variety of symptoms including eye, nose, and throat irritation, headache, nausea, diarrhea, hoarseness, sore throat, cough, chest tightness, nasal congestion, palpitations, shortness of breath, stress, drowsiness, and alterations in mood [46]. These are some of the symptoms reported by some residents living near sludge land application sites (Table 1).

Methods of sludge application are likely to influence the impact of pathogens, odors, and irritants. However, little to no research has been done to document the impact of different management practices. Under the 503 rules, several management requirements are established that are relevant to potential exposure of people to pathogens in Class B sewage sludges. These include a 10 m setback from watercourses, a requirement that public access be restricted to the site for a specified time period, and restrictions on how soon after application animals may be allowed to graze or crops can be harvested. The implementation method for the public access restriction is not specified and is usually based on posting

of signs with no physical barriers. No setbacks from residences or drinking water wells are required under federal rules.

In addition to pathogens, endotoxins, molds, and fungi are possible constituents in sludges that can cause disease. The combination of these biological agents and irritant chemicals in sludges may present particular risks [47].

No formal assessment of the risks posed by pathogens in Class B sludges has been conducted, nor has the potential interaction between chemicals in sludges that can cause respiratory irritation with pathogens been considered [48]. Exposure to persons living near application sites to these contaminants may pose the most acute risk, especially to children, the elderly, the immune-compromised, and other susceptible populations. The potential for illness resulting from airborne movement of pathogens has not been considered under the current rules [49]. This, along with movement in runoff from sludged sites, is likely to be the most prevalent route of exposure of neighbors to pathogens and contaminants in Class B sludges.

In contrast to the many investigations of the impact of sludge use on plants and soils, little research has been conducted that addresses the health impacts of land application. One study of farm families in Ohio is often cited as evidence that sludge application does not cause disease [50]. The paper found no significant health differences between persons living on farms where sludges had and had not been applied. The authors specifically state, however, that "[c]aution should be exercised in using these data to predict health risks associated with sludges containing higher levels of disease agents and with higher sludge application rates and larger acreages treated per farm than used in this study." The study clearly did not study "worst case" conditions since sludges were incorporated into the soils (none were surface applied or stockpiled), were applied at relatively low rates (0.9-4 tons/acre), and were relatively odor-free, indicating that they were well treated and stabilized. Since the sludges themselves were not tested, they may or may not have contained pathogens. There were also methodological constraints, including the fact that approximately 70 percent of the original 297 participants dropped out before the three-year study was completed.

CONCLUSIONS AND RECOMMENDATIONS

Disposal of sewage sludges via spreading on agricultural, forest, and mine lands is a growing practice. The complex mix of biological agents and chemical contaminants contained in sewage sludges exposes workers and people living near sites where they are used as soil amendments to risks that are poorly understood. These risks include acute risks as well as chronic risks posed by potential long-term exposure. Recent reports from neighbors to land application sites of illness and even death suggest that pathogens, endotoxins and

contaminants coming from land application sites may pose an acute and immediate risk.

Only one scientific investigation of the numerous anecdotal reports of illness associated with land application sites has been carried out. Health professionals in communities faced with sludge application must be made aware of the potential risks and symptoms experienced by neighbors elsewhere so that proper diagnoses can be made and the true magnitude and nature of illness attributable to land application of sewage sludges can be assessed. Information should be provided to local health departments and medical professionals in areas where land application of sludges takes place so that they are prepared to respond to reported illnesses.

Systematic tracking of health incidents and scientific investigation of incidents is urgently needed. Persons experiencing illness need to know to whom to report their complaints. Given the current lack of tracking, they should keep records of their complaints and should send them to local, state, and federal agencies. Involvement of the Center for Disease Control or other agency qualified to conduct health investigations is needed to investigate the reports of illness associated with land application of sludges.

The factors with regard to sludge type and treatment, environmental conditions and sludge management practices that may contribute to illness have not been investigated, so we are unable to identify recommendations or requirements that may protect public health. Until investigations are carried out that answer these questions, land application of Class B sludges should be viewed as a practice that subjects neighbors and workers to substantial risk of disease.

The practice of applying sewage sludges to the surface of land without incorporation into the soil appears to present a particularly high risk. It would be prudent to eliminate such applications of Class B sludges. Even under less risky application scenarios, there are risks of illness associated with application of Class B sludges. The potential for off-site movement of chemicals, pathogens and endotoxins suggests that use of Class B sludges should be eliminated. Class A sludges have been treated to further reduce pathogens, but would not have reduced levels of chemical contaminants or endotoxins. Thus, the potential health risks posed by Class A sludges associated with chemical contaminants and endotoxins may warrant reconsideration of putting them on land.

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EXHIBIT 2

1 of 2

Received
11-15-04 @ CC mtg

Do we want to defend a lawsuit charging the city with responsibility for causing the death of a citizen?

I think it might be hard to defend against such a charge, if we continue to spread Biosolid B on fields adjacent to our water supply.

Biosolid B Sludge information does not address all possible diseases and contaminates. Studies indicate more research is needed to determine if spreading Biosolid B sludge is really safe.

Until the research is sufficient to indicate all disease germs and other contaminates are destroyed, no Biosolid B Sludge should be spread on fields adjacent to our water supply.

I have checked a few sources of information by typing Biosolid B information into the search window of Google. You can check these sources and I suggest you spend a few minutes reading the information that appears.

Research indicates that Biosolid B Sludge treated and allowed to be exposed to sunlight for an adequate period may be considered safe as per guidelines of the Environmental Protection Agency. The Scientific Community is not in agreement that it is safe. The

Kathy Ashinger

Do we want to defend a lawsuit charging the city with responsibility for causing the death of a citizen.

I think it might be hard to defend against such a charge, if we continue to spread Biosolid B on fields adjacent to our water supply.

Biosolid B Sludge information does not address the possible diseases and contaminants. Should additional research is needed to determine if spreading Biosolid B sludge is really safe.

Until the research is sufficient to indicate all disease germs and other contaminants are destroyed, no Biosolid B Sludge should be spread on fields adjacent to our water supply.

I have checked a few sources of information by typing Biosolid B information into the search window of Google. You can check these sources and I suggest you spend a few minutes researching the information that appears.

Reasons indicate that Biosolid B Sludge needs and allowed to be exposed to sunlight for an adequate period may be considered safe as per guidelines of the Environmental Protection Agency. The Scientific Community is not in agreement that it is safe. The

Scientific Community indicates the tests do not include all diseases and contaminates which are found in Biosolid B Sludge.

Biosolid B Sludge was spread this summer on fields adjacent to the Chetco River. These fields are less than one half mile from the Brookings Water Intake.

The fields will be flooded this winter. I do not think there has been sufficient sunlight exposure to eliminate the disease germs and contaminates.
I request the Council stop all spreading of Biosolid B Sludge on these fields until the Scientific Community is in agreement with the EPA.

Larry Aslinger
439 Buena Vista Loop
Brookings, OR 97415

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