ARSENAL OR CATERPILLAR

Environmental History in the Joliet Army Ammunitions Plant

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WHERE THE STREETS HAVE NO NAME

The railroad tracks from Chicago stop at the edge of a small town but the straight, level railbed goes miles further. There are no construction teams on the railbed. It's not a new railroad being built. Rather it's all that remains of an old one. It once carried goods we no longer need from a place that's no longer there.

Following it, you pass a cluster of grain silos making your way into open country surrounded by cornfields. Then you reach a massive unkempt property bounded by a rusty barbed wire fence that stretches farther than you can see. Here the railbed branches out, connecting to networks of other stripped railbeds that serve dozens of strange-looking buildings within the fence. There are rows of grass-covered concrete bunkers with heavy steel doors. Some have been left open and you can see they're completely empty. Not far away, there are vacant industrial buildings being reclaimed by nature. Tiles and asbestos hang from their ceilings. They smell like the animal waste that's scattered on their floors. Most of their windows are broken and the wind has scattered papers left on desks or in open file cabinets. Dark algae-filmed water fills their basements to the tops of their stairways. Ivy creeps up their outside walls and tall grass grows in the buffer zones between them. Away from the railbeds in the overgrowth, there's a crumbled foundation that looks like it could have been a barn or a farmhouse. Under a stand of tall trees near the middle of the site, there's a cemetery where all the headstones are dated before 1940. This place may have once been someone's home, or a factory, or a depot. Whatever it was, it was abandoned quickly and long ago.

Now you hear in the distance the rumble of diesel engines. Within the site's southern boundary, backhoes are piling trash onto a small mountain of a landfill. To the northwest, in a rail yard where the tracks haven't been stripped, trains are loading cargo from warehouses owned by Walmart and other companies. Surrounding the area you've explored, there are two industrial parks, an oil refinery, and acres of farmland. The way developed properties are wedge against it suggests this plot is valuable real estate. So who owns it? And why is it so special that it can't be sold?

The answer has to do with a munitions plant built here during World War II. It was put up in a matter of months and vacated just as quickly a few decades later, leaving an unused plot to be divided and sold by the federal government. This is the story of how that bomb factory turned 1940s farmland into one of America's most unusual landscapes. It's about the bodies buried in the cemetery, the toxic chemicals buried in the landfill, and the human values attached to both. This is, most of all, a story about those values, how they've changed, and how they've struggled for this piece of land since World War II.

A FAMILY HOME

Before the War, the Leupold brothers lived on a few acres of farmland near Joliet, Illinois. In late 1940, they were told by the U.S. Ordnance Department to sell their home or else fight the federal government in court.[1] The Leupolds were among hundreds of farmers asked to leave the area. The reason, they were told, was so that a massive munitions plant could be built on their land. One way or another, the Leupolds and their neighbors were gone within a few months. But in 1949, almost a decade later, the Leupolds would write to the War Department asking for their land back.[2] They'd presumably gotten on with their lives elsewhere for nine years, but they were still attached to the land they'd left behind. Farms like the Leupolds' had sentimental value above the Ordnance Department's asking price. That's why, when they were told to leave, many Joliet area farmers put up a fight.

The American public of 1940 didn't see the war as a struggle between good and evil. Hitler was murdering innocents in Europe but that wasn't widely known in the U.S. The war, as many Americans saw it, had little to do with them. That's why, until the Pearl Harbor attack, public opinion favored noninvolvement. Like many other Americans, many Joliet farmers were rooting for the Allies, but they weren't ready to sacrifice their homes for the cause. So they had a short-lived protest. They had at least one community meeting during which an Army Colonel promised homeowners fair compensation for their land but assured them the plant's construction would start on the planned site in the next thirty days. The assembled community members couldn't stop the plant's coming or their going, but their protest still left a mark on the landscape.

The farmers wanted their cemeteries left alone. Although the Ordnance Department may have planned to dig up and relocate the graves, they granted the Joliet community that one concession, leaving at least three cemeteries sitting between sections of the plant.[3] The cemeteries are today the most tangible evidence of the multi-generational farm families from before the war. Their headstones recall both the people buried there and their children who moved away when the plant moved in.

THE ARSENAL OF DEMOCRACY

For the federal Government, the land transfer was, predictably, a public relations disaster. But it was a difficult one to avoid. The U.S. needed military explosives as soon as World War II started – if not for itself, then for those defending its interests. To make those explosives, the U.S. Ordnance

Department would have 77 munitions plants built between 1940 and 1943. Because of the resources needed to build the plants, many, would have to be sited on land bought or taken from midwestern farmers.

According to government specifications, to be safe from enemy invasion, each plant had to be between the Appalachian and Rocky Mountains and at least 200 miles from national borders. Each plant would need close-by waterways for production and waste disposal. And, to move the raw materials and finished products efficiently, each plant would need access to major railroad and highway arteries. Finally, because of the risks of manufacturing explosives, each plant site would need room for blast buffers. Plant buildings would have to stand far enough apart so that an accidental explosion couldn't cause explosions elsewhere (It's because of this requirement that JAAP occupied so much space and displaced hundreds instead of dozens of farmers). The requirements meant that ordnance plants would be most easily sited on bodies of water in the greater metropolitan areas of the mid- and near west. Wherever the Ordnance Department went, chances were it had to kick someone out.

The site near Joliet was no exception. It was in the middle of the country, with thousands of acres to build on. It had easy access to Chicago's transportation infrastructure and to the Illinois River watershed. In addition, it had access to the human resources it would need – an ample workforce and public support. The displaced farmers were dissatisfied by the plant's establishment, but plenty of people in the region wanted the plant nearby for the cash it would bring. An article in a 1940 *BusinessWeek* says would-be construction workers came looking for work even before the project had begun.[4] In that same issue, ads sponsored by the State of Illinois flaunt Chicago's infrastructure, asking industries to take advantage of the region's railroads.[5] The state government, job seekers, and Ordnance Department planners agreed that the chosen plot south of Joliet was an excellent place for a munitions plant. And yet as perfect for them as the site then was, it would soon become mostly useless.

After World War II, the U.S. would never again need such a massive bomb-making operation. But there was still the Cold War, so the Joliet Army Ammunitions plant, or JAAP, as it was eventually named, was put on standby instead of being shut down. It supplied U.S. forces in the Korean and Vietnam Wars. Then, in 1977, it closed for good. War as the U.S. knew it had declined. Most American military campaigns after that are what international relations theorist Mary Kaldor calls "new wars" – low-intensity conflicts involving non-state belligerents like Al-Qaeda.[6] The Air Force can't carpet bomb a guerilla cell like it can a city, so it wouldn't need the bombs. Also, no power comparable to the Nazi menace would threaten invasion, so the Army would no longer need to hide its production in the country's midsection. It would get what ammunition it needed from East Coast plants

closer to war zones across the Atlantic. In addition, the military and its contractors would develop new munitions technologies that made some of JAAP's facilities obsolete.[7] JAAP ran its course and became useless to the military. But the land it left behind, and the condition it was left in would shape a new struggle in the coming decades.

AN OPEN MARKET

A lot had changed by the time JAAP shut down so that a new set of buyers had become interested in the plot. As the car's popularity had increased, so too had the number of car commuters who could afford to live dozens of miles from their workplaces downtown. Around the nation's cities sprang up suburbs designed for those commuters and their cars – suburbs distinguishable by their curving non-grid street plans, the garages built into to every one of their houses, and, sometimes, their lack of sidewalks.[8] Since World War II, automobile suburbs had advanced from the edges of Chicago's metropolis. In satellite images, you can see their curved plans densely covering land between twenty and thirty-five miles from the Chicago Loop. As the suburbs had sprawled, they had brought the metropolitan area closer to JAAP, making land increasingly scarce and valuable.

But it wasn't just that land had become scarce. A market had developed that brought new interests to the JAAP site. As industries had grown in the post-war decades, more companies had become nationwide businesses and had to deal with economies of scale. A new corporation called Wal-Mart, for instance, had begun its rapid expansion and needed to coordinate its store network to increase profits. To successfully cut their costs, growing companies needed enough transportation resources – warehouses, depots, trucks, barges, and trains – to make sure that opening a new store or factory didn't mean cutting off the inventories of old ones.[9] There was a growing demand for commercial shipping solutions and property developers would try to profit from it by building and leasing things like warehouses and train depots. JAAP already had an industrial rail depot and it also had access to railroads, highways, and rivers, which made the site look like an excellent investment. Developers would eventually build an industrial park on the south side of the site and expand JAAP's rail depot, making it into an intermodal shipping facility (where Walmart – spelled without a dash since 2008 – now operates a warehouse). But those projects would only take up a fraction of the JAAP site and they wouldn't start until years after JAAP's shutdown. As in-demand as the real estate was, pieces of it weren't sold for a long time, and most of it wasn't sold at all, but repurposed. Something was keeping the federal government from getting rid of it.

A HEALTH RISK

In the '90s the Army would hire contractors to perform a series of "ecological risk assessments" of JAAP's soil. One site investigated would be the area where plant workers had regularly burned waste explosives. The contractors would use samples of the burning ground soil to study how concentrations of explosive residues affected survival rates of cucumbers, earthworms, and bacteria. Their results would be inconsistent. Predictably, higher concentrations of explosive chemicals would correlate with more deaths among the three organisms. But, unexpectedly, some explosive-free soils would also be significantly harmful.[10] One contractor would suggest the reason could be the presence of other pollutants, like heavy metals, in the soil and would encourage the Army risk manager to conduct further studies to learn exactly what the Army would be liable for.[11] Years of different kinds of pollution left sections of the soil so contaminated in so many ways that the Army wouldn't even know what it had to clean up.

Pollution was inherent to the 1940s manufacturing process used in JAAP. Workers started with a batch of toluene and would, three times, add nitrate molecules, which bonded to the toluene hub, yielding trinitrotoluene, or TNT. Effective military-grade TNT had to be nearly pure 2,4,6 TNT (The 2,4,6 represents the positions where the nitrate molecules should be bonded to the toluene hub.)[12] A problem with the TNT-making process as it was conceived in 1940 was that it yielded an impure mixture of 2,4,6 TNT and useless 2,4,5-, 2,3,4-, and 2,3,6 TNT. The useless TNT molecules had to be extracted from the batch in a process called "washing."[13] Washing eliminated most of the useless – along with up to 5 percent of the useful – TNT so that the factory had two products: the almost-pure batch of useful powder, and a mixture of wastes called "red water."[14] JAAP flushed its red water into nearby Prairie Creek, which feeds the Kankakee, and in turn, the Illinois and Mississippi Rivers.[15] The red water went in the streams while the contaminants from the burning ground and other sites sank into the groundwater, where they could migrate to nearby communities' well water.

Before we put JAAP on trial, we should ask, why is this bad? The answer is we're not entirely sure. TNT in the bloodstream can break down the walls of red blood cells, keeping them from delivering oxygen to the other cells in the body – what we call anemia.[16] Otherwise, TNT can cause liver failure.[17] It can kill a person if it's absorbed in a high enough concentration. But we don't fully understand what that concentration is or how it gets into the body. Even writers of recent medical studies complain of a lack of quantitative data on the medical effects of ingesting TNT.[18] Government officials in the '40s knew even less. They didn't understand the toxicokinetics well enough to save 22 workers dying from TNT exposure during World War II.[19] In obvious ways, the lack of information was

terrible for the Army; but, in a more indirect way, it was convenient. Knowing little about the potential effects of TNT in the environment, it was easy not to worry about it. Because the American public had grown worried about attitudes like that, the Army had been made responsible for JAAP's contaminated soil.

Books like Rachel Carson's *Silent Spring* had convinced Americans to expect the worst of pollution so that, even if they didn't fully understand its consequences (as it didn't with TNT), they could still demand a cleanup.[20] Instead of forgetting what chemicals were put into the environment, as anyone easily could, Americans became increasingly concerned about them. That's why the use of pesticides declined. It's partly why Congress and President Nixon created the EPA, and partly why Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (commonly known as Superfund), under which the Army was made liable for cleaning JAAP.[21] Because of Carson-like attitudes in the American public, EPA officials didn't need to fully understand the risks of contamination to mandate a cleanup effort that wouldn't be finished until the late '90s. Until it was decontaminated to the EPA's standards, no part of JAAP could be sold or repurposed.

A BUTTERFLY

While the Army and its contractors were decontaminating parts of the site and developers were bargaining for pieces of it, a group of conservationists came to JAAP. Walking through the site, they probably saw fields dotted with burr oak and patches of waist-high grass and prairie flowers and they got the idea that this piece of land could go back to what it was before World War II and even before western settlement. With a human hand, the patchy ecosystem that had developed in JAAP could become a real prairie and a national park.

JAAP's soil was heavily polluted in concentrated areas but, because the plant's buffer zones spread the facility across such a large area, the land was mostly open and uncontaminated. Having decades ago forced out the areas farmers and their crops, JAAP had unintentionally started the work of building a prairie. Prairie grasses had fewer competitors and plenty of room to grow. Native bird species, too, thrived within JAAP in a way they couldn't in the surrounding landscape.[22] As writer Tony Hiss put it, JAAP was an "industrial brownfield… with a huge green difference."[23] It had unique potential to become a national park.

If it did, it would be unique among national parks – one of the only parks laid on land with such a heavily developed past. That's partly why conservationists put a high romantic value on the would-be park. If it could make the transformation, they argued, it could become a resource for the common good. It could be a classroom and a

recreational space for 100 million people within a day's drive.[24] Even better, the park would be a moral resource – a symbol of peace. By turning "bombs into blossoms," the community would be making good from the evil of war.[25] "Midewin," as they wanted to call it, was a word from the language of the long-gone Potawatomi that meant "healing society."[26] The prairie wouldn't just serve the urban area; it would nourish it.[27] For Midewin's supporters, the struggle for the JAAP property was one for ideal land use and ideal society.

They would eventually win, establishing Midewin National Park, which now occupies most of the acreage of the former JAAP site. The prairie is a work in progress. Since mature prairie soil can take a century to develop, parts of the park still are still weedy, overgrown, or vacant-looking.[28] Conservationists would work hard, but to make Midewin a reality, they needed help from the Army and from a strange exception in EPA policy.

A CHORE

The Army's contractors used at least two methods of "remediating" JAAP's contaminated soil. Partly because the Army didn't know what kind of pollutants were in particular areas, most contaminated soils would just be disposed of – excavated, dumped at the on-site landfill and replaced by soil from somewhere else.[29] The Army had to move hundreds of thousands of cubic yards of soil before the site would be acceptable to the EPA.[30] The Army Environmental Command (USAEC) estimated the project could cost up to $200 million.[31] But the USDA and EPA allow a lower decontamination standard for non-residential, non-industrial land use.[32] Because Midewin National Park wouldn't have permanent residents or many plumbing systems drawing from the polluted groundwater the Army was able to tailor its cleanup operations and limit the project's cost to around $20 million dollars – a tenth of the high estimate.[33] As a U.S. Army publication would frame it in a section called "Defending Your Dollars," the Army had resourcefully saved an unnecessary expense. [34] But it left to Midewin sections of contaminated soil and groundwater.[35]

IN FACT A COMMUNITY

The place is simultaneously a natural beauty, a health risk, and a desirable piece of real estate. Decades ago it was FDR's "arsenal of democracy," and before that, a group of family homes. The answer to the question "what is this place?" depends on who and when you're asking. Since 1940, people have been struggling over how this land should be used. None of them ever got exactly what they wanted. Instead, their competing values made this place into one that could not exist anywhere or any when else.

Businesses and developers would love to use this land, and to the extent that they can, they have, but laws about contaminated soil mostly shut them out. For those laws to have existed in the first place, people had to become worried about the sometimes-vague connection between pollution and disease. For industries to have wanted the land in the first place, it had to have become an attractive commodity. That couldn't have happened without the midcentury evolution of the car, the suburb, and the national corporation. For the land to have been available to anyone, it had to be vacated of the headstrong farmers who wouldn't have willingly sold their sentimental property just for cash. For Midewin to be established, there had to be strong community support. For that to happen, people in the community had to have romantic ideals about nature preserves and the beauty of the American landscape. For the land to have become available after the war, it had to become useless to the Army. Global conflicts had to transform so that nations would no longer need a massive volume of explosives to fight in them. Most necessarily, there had to have been a World War II in the first place. Forces at work on the other side of the world that threatened the United States' hegemony in its own hemisphere created the need for JAAP and, in turn, the opportunity for future land users. The landfill, the industrial buildings, the overgrown cemeteries, and the prairie blossoms, are all symbols of modern American history.

Maybe the most fitting symbol, though, is the first one you saw – the stripped railbed that led you here. To say that "it once carried goods we no longer need from a place that's no longer there," is to tell an incomplete story. Today the railbed and its branches are maintained as dirt trails. They no longer carry bombs but they carry hiking nature enthusiasts who think of the land as a natural spectacle rather than a piece of capital. Like the munitions plant, the railbeds are, essentially, the same thing they used to be. Yet the subtraction of two rails and the coming of a new era and new values have made them into something that is, in its relationship to people and the environment, entirely different. It's an industrial ruin, a natural beauty, and a history exhibit.

NOTES

[1] "U.S. Taking Arms Plant Site Now, Objectors Told," *Chicago Tribune*, September 25, 1940, Proquest Historical Newspapers: Chicago Tribune (1849-1988). Accessed April 15th, 2012, http://www.proquest.com/.

[2] Letter to Paul L. Mather from Leupold Brothers, December 26, 1949; Box 420, Elwood Ordnance Plant, Elwood, IL. Real Property Liquidation Files; Chicago Region, record group 270, National Archives Bldg, Chicago, IL.

[3] Kane is uncertain whether it was Ordnance Department policy to move graves, but she says it did happen. Goc says that the Ordnance Dept. had planned to move graves at BAAP, but decided not to after a sharp public outcry. See Kimberly L. Kane, *Historic Context for the World War II Ordnance Department's Government-Owned Contractor-Operated (GOCO) Industrial Facilities, 1939-1945*, (Plano, TX: Geo-Marine Inc., 1995) 191. See also: Goc, 111.

[4] "Defense Comes to Main Street," *BusinessWeek*, November 2, 1940.

[5] Ad in *BusinessWeek*, November 2, 1940.

[6] Mary Kaldor, *New and Old Wars*, (Stanford, CA: Stanford University Press 2001) 1.

[7] The authors point out two big drawbacks to TNT production in plants like JAAP: inefficiency and pollution. The development they're selling in this fact sheet solves both. See Mr. Anthony W. Arber, Javid Hamid, Dr. Robert M. Endsor, "Elimination of Redwater Formation from TNT Manufacture," Strategic Environmental Research and Development Program WP-1408 fact sheet, December, 2007, accessed April 15, 2012, pdf can be downloaded here: http://www.serdp.org/Program-Areas/Weapons-Systems-and-Platforms/Energetic-Materials-and-Munitions/Explosives/WP-1408/WP-1408.

[8] William Cronon, History, Environmental Studies, Geography 460, "American Environmental History," lecture 19: "Environmentalism Triumphant?" Spring 2012.

[9] Economies of scale happen when a firm opens another factory or store. If resources aren't coordinated, that expansion can diminish profits. Arthur O'Sullivan, Stephen M. Sheffrin and Stephen J. Perez, *Microeconomics* – 7th ed., (Boston: Prentice Hall, 2012) 192.

[10] "Evaluation of Soil Toxicity at Joliet Army Ammunition Plant," Environmental Toxicology (April 1995): 629.

[11] Ibid 630.

[12] This study also gives a good overview of the TNT-manufacturing process. Arbor, Hamid and Endsor, 3.

[13] Ibid.

[14] Ibid, 5.

[15] Aerostar Environmental Services, Inc., "Second Five-Year Review Report Soils Operable Unit for Joliet Army Ammunition Plant (JOAAP) Wilmington, Illinois," August 2009, accessed April 15, 2012, 33.

[16] "Toxicological Profile for 2,4,6-Trinitrotoluene," Agency for Toxic Substances and Disease Registry, June 1995, accessed April 15, 2012, 29.

[17] "Toxic Jaundice" is one of the notable causes the author points to for factory deaths during World War II. Ibid, 17.

[18] Ibid, 77.

[19] McConnell WJ, Flinn RH, "Summary of twenty-two trinitrotoluene fatalities in World War II." Journal of Industrial Hygiene and Toxicology 28:76-86 1946. As quoted in "Toxicological Profile," 38. http://www.atsdr.cdc.gov/ToxProfiles/TP.asp?id=677&tid=125.

[20] At the end of the broadcast, Eric Sevareid implores viewers to find out more about just what risks come with DDT and other pesticides. See "The Silent Spring of Rachel Carson," CBS Reports, April 3, 1963.

[21] "Origins of the EPA," The Guardian – EPA Historical Publication, Spring 1992. Accessed at epa.gov on April 15, http://www.epa.gov/aboutepa/history/publications/print/origins.html.

[22] Tony Hiss, "Bombs into Blossoms," *Preservation,* July/August 1998, 78.

[23] Hiss, 76.

[24] Hiss, 78.

[25] The title of Hiss's article in *Preservation*, Ibid.

[26] Hiss, 78.

[27] Hiss, 78.

[28] Hiss, 80.

[29] Using Google Earth's historical imagery feature, you can see sites described in Aerostar's five-year review being excavated as the Prairie View landfill gets bigger. Ibid. See also Google Earth, http://earth.google.com/.

[30] Aerostar Environmental Services, 58, 74.

[31] This is part of an interesting dialog between the Army, the EPA, and the USDA. I'd like to have found more documents like it. Among other things that would help answer the "I don't know" in the conclusion. "Joliet Reduces Prairie Cleanup Costs," *Environmental Update*, vol. 17, no. 4 (Fall

2005), accessed April 15, 2012, http://aec.army.mil/usaec/newsroom/update/fall05/fall05.html.

[32] The USDA refers to the cleanup plan implemented as below the "residential standard." See Logan Lee, "Decision Notice & Finding of No Significant Impact Land and Resource Management Plan (Prairie Plan) Amendment #1 – Establishment of Management Area 3 and Designation of Utility Corridors into MA 2," June 26, 2008, 1-2. Accessed April 15, 2012, http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5158006.pdf.

[33] "Joliet Reduces Prairie Cleanup Costs," *Environmental Update*, vol. 17, no. 4 (Fall 2005), accessed April 15, 2012, http://aec.army.mil/usaec/newsroom/update/fall05/fall05.html.

[34] "Joliet Reduces Prairie Cleanup Costs." Midewin planners call the still-contaminated areas "soil restriction areas and groundwater management zones," see also, Logan Lee, "Decision Notice & Finding of No Significant Impact Land and Resource Management Plan (Prairie Plan) Amendment #1 – Establishment of Management Area 3 and Designation of Utility Corridors into MA 2," June 26, 2008, 1-2. Accessed April 15, 2012, http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5158006.pdf.

[46] The cover photo is a photocopy of a photocopied image (hence some of the distortion.) The camera faces north. The patch of woods under the glare spot in the middle top left is Starr Grove. it's an aerial photo of the Load-Assemble-Pack area, 1952, from box 145 Elwood Ordnance Plant, Elwood, IL, Real Property Liquidation Files, Chicago Region, RG 270, National Archives Building, Chicago, IL.

[47] 1" = 3.4 km, USDA Farm Service Agency 2011 via Google Earth, accessed April 15, 2012.

[48] 1" = 1000 meters, U.S. Geological Survey, 1993 via Google Earth, accessed April 15, 2012.

[49] Arbor, Hamid and Endsor, 4.

[50] Photo posted by doppelganger on Panaramio, accessed April 15, http://www.panoramio.com/photo_explorer#view=photo&position=16&with_photo_id=27568456&order=date_desc&user=3726389

[35] Midewin planners call the still-contaminated areas "soil restriction areas and groundwater management zones," see Logan Lee, "Decision Notice & Finding of No Significant Impact Land and Resource Management Plan (Prairie Plan) Amendment #1 – Establishment of Management Area 3 and Designation of Utility Corridors into MA 2," June 26, 2008, 1-2. Accessed April 15, 2012, http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5158006.pdf.

IMAGES

[36] The cover photo is a photocopy of a photocopied image (hence some of the distortion.) The camera faces north. The patch of woods under the glare spot in the middle top left is Starr Grove. it's an aerial photo of the Load-Assemble-Pack area, 1952, from box 145 Elwood Ordnance Plant, Elwood, IL, Real Property Liquidation Files, Chicago Region, RG 270, National Archives Building, Chicago, IL.

[37] 1" = 3.4 km, USDA Farm Service Agency 2011 via Google Earth, accessed April 15, 2012.

[38] 1" = 1000 meters, U.S. Geological Survey, 1993 via Google Earth, accessed April 15, 2012.

[39] Arbor, Hamid and Endsor, 4.

[40] Photo posted by doppelganger on Panaramio, accessed April 15, http://www.panoramio.com/photo_explorer#view=photo&position=16&with_photo_id=27568456&order=date_desc&user=3726389

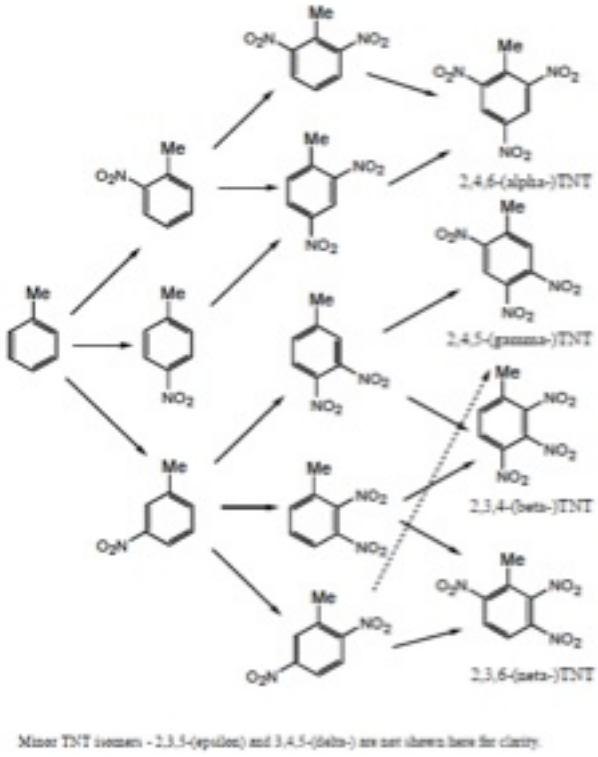
The JAAP site (highlighted) as it is today. Midewin owns most of the plot east of Illinois Route 53.[37]

A illegible rusted-over street sign in JAAP

One of JAAP's stripped rail beds

A plant building's flooded basement

Diagrams of a 2,4,6 "useful" TNT molecule (top right) and the "useless" isomers directly below it[39]



Minor TNT isomers - 2,3,5-(epsilon) and 3,4,5-(delta-) are not shown here for clarity.

An example of post-World War II suburban sprawl around Oak Brook, Illinois[38]

Non-prairie overgrowth on the JAAP site

An Aldo Leopold quote near the Midewin park office[40]