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Miamisburg Mound Comprehensive Reuse Plan

Prepared for:

Miamisburg Mound Community Improvement Corporation

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Miamisburg Mound Comprehensive Reuse Plan
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Understanding the Reuse and Development Planning Process for Mound

There are several key factors that will interact with one another to affect the reuse plan and implementation strategy adopted for Mound. These include, but certainly are not limited to:

1. The ten-year time horizon which has been set by Miamisburg Mound Community Improvement Commission (MMCIC).

2. The need to retain and replace jobs at Mound.

3. The fact that, for the most part, the facilities at Mound are highly specialized in their commercial applications.

4. The environmental clean-up process whereby Mound is "released" to MMCIC over a ten-year period with the undeveloped land coming under MMCIC's full control first and most of the major building assets being available only on a lease basis until near the end of the decade.

5. The need for the reuse of Mound to have minimal negative impact on the fiscal health and well-being, of the community--for the plan to be "economically feasible" such that revenues at least offset, if not exceed, costs.

6. The physical characteristics of Mound: the fact that it lacks direct access to interstate highways, is self-contained with respect to all utilities and services, and is situated atop a prominent hill underlain by rock at shallow depths.

7. The age and condition of many of Mound's facilities; their non-compliance with building codes, access guidelines, and other "free-market" requirements (i.e., lack of adjacent parking).

Each of these factors has implications for the reuse and development plan for Mound. The desire to dissolve MMCIC in ten years suggests that the marketing of Mound cannot be confined to the exotic technologies which have been the mainstay of the research that has taken place at the facility over the past fifty years. Rather, Mound must be marketed concurrently on several fronts, and perhaps to several market segments, if the goal of full privatization is to be realized in ten years. This factor is especially important with regard to the schedule for release of the site to MMCIC. In the early years of plan implementation, fee simple sales to private owners will be limited principally to the undeveloped portions of the site while remediation of environmental contamination is taking place in many of the facilities. Moreover, time and money will be required to bring Mound's facilities up to code, modernize the site's roads and infrastructure, and develop the site "amenities" on the hilltop that private businesses (and their lenders) will require.

Thus, the reuse plan for Mound has many of the characteristics of a real estate workout, and it is akin as well to a "corporate restructuring." In a workout, usually a lender which has held a secured interest in real property seeks to cut its losses as quickly as possible. To do so, often planners and engineers are brought in to re-design the project, cut construction and operations costs, and formulate a construction/development phasing schedule that matches sales and absorption so that revenues keep pace with costs to the extent possible.

Planning for the reuse of Mound is also similar to the process that many industries now are following in their efforts to "right-size" their operations and maximize profits. In the process of restructuring their firms, corporate executives look to shedding divisions which are not within the realm of what they define (or sometimes redefine) as the "core business." These "marginal businesses" often are sold to others or, in some cases, simply abandoned. Similarly, the reuse planning process must identify and better understand the core businesses (technologies) at Mound. (Considerable work in this regard has been done by the University of Dayton-CBER.) To do so, several key questions must be answered; for example: Which of Mound's many technologies have the greatest potential for private sector applications, and which ones, although not without their value to the private sector, have very limited marketability? What are the important "synergies" between technologies and facilities at Mound, and what are the marginal technologies or facilities that could be eliminated without adversely affecting (even enhancing) the attractiveness of the remaining "core businesses" to the private sector? The planning process must result in a "strategic development plan" that optimizes Mound's technologies and assets and minimizes the fiscal and environmental impacts of reuse and development.

The undeveloped land at Mound may prove to be its most marketable asset. Since many of the functions that private industry would perform at Mound--research and development, and product testing and quality control--are not normally business profit centers but are, in fact, overhead functions (a cost of business) the opportunity to "co-locate" on the undeveloped land at Mound could attract fully integrated manufacturing operations consisting of newly developed production facilities on the "hilltop." This would eliminate the need for a manufacturer to incur the capital costs of developing the space and acquiring the facilities necessary to support R&D and product testing, yet these functions would be immediately available. For example, would an air bag manufacturer find Mound attractive because it could build a state-of-the-art production facility on Benner Road, while utilizing the explosion chambers in Building 87 to test its product? Similarly, since many of the production facilities at Mound are limited to "pilot scale" operations consistent with their military mission, is there a manufacturer interested in building a plant on the adjacent undeveloped land at Mound to boost the scale of certain product to a level that reduces unit costs to acceptable and competitive price points? The potential for synergies of this type, and others, is likely to be one of Mound's greatest competitive advantages in the marketplace.

When all is said and done, however, although the presence of exotic technologies and high capital cost facilities may be an important magnet for businesses, Mound will have to withstand conventional scrutiny in terms of how it measures up as a real estate transaction. Commercial lenders tend to shy away from, or charge a huge premium for, financial deals which clearly have only limited resale value. This applies not only to the too-expensive house in the so-so residential neighborhood, but also to the industrial or office building which is difficult to access, is old and lacks adjacent parking, and which is designed for a single, or but a few specialized applications.

Further compounding Mound's competitive position in the market is the fact that costs for operating and maintaining Mound, reportedly more than $9,000,000 annually ($7/sf), approach or exceed the typical rent for industrial space in the market. Accordingly, for space at Mound to be competitive with other alternatives available to business and industry in this market area, careful examination of these costs is warranted. For example, is it the particular function or use of the facilities, which is disproportionately contributing to the cost of operations? If so, can these facilities be sold or abandoned without jeopardizing the marketability of the remainder of the Mound? If this function is critical to the success of the reuse program, can it be made more efficient, or can third-party funding be found to subsidize the "premium" component of the total cost for this function?

In consideration of the foregoing issues, the reuse and development plan for Mound will need to "optimize" the facilities, infrastructure and site. This means combining the results of the assessment and testing of market potentials with the results of the facilities, infrastructure and site analyses to selectively "down-size" Mound, removing buildings and eliminating costly infrastructure systems (or gradually integrating some or all with municipal or county systems) in order to create an "industrial park" that supports a set of high-value, marketable technologies in a group of buildings each of which sits on its own lot and is reasonably served by its own parking lot(s), and for which the cost of utilities services and maintenance is "reasonable." Through "strategic site clearance" the reuse plan can make the costs of operation and maintenance more manageable, facilitate the phased upgrading of utilities and improvements to roads, and enhance the site's attractiveness to private industry.

While it is appropriate to focus on the technological resources of Mound as a marketing strategy, the marketing of the site also must promote the assets of Miamisburg and the greater Dayton/Cincinnati region as a whole. As important as the technologies available at Mound are, the quality of life available to executives and workers alike will be an important determinant for businesses considering Mound. The reuse planning process, therefore, needs to consider not only site-specific issues, but also how Mound fits within its local and regional context. This will include exploring better linkages with the regional transportation systems, integrating the site into the community fabric by extending adjacent public open space into and through the site and, perhaps, helping the city meet demands for community uses such as recreational facilities and/or municipal services. The planning process also must carefully evaluate

development options to ensure that, in the effort to retain and create jobs at Mound, short-term solutions do not contribute long-term problems, such as traffic congestion or over-crowded schools, that detract from the city's/region's quality of life.

The potential for locating an institution of higher education at the site presents an opportunity that the planning process should explore further. Certain of Mound's technologies could help support a research curriculum, while the synergy between education and industry could attract skilled researchers, grant moneys and private investment to Mound. A college or university could also provide a "brain trust" that could spawn new technologies and businesses, as well as provide a source of highly trained personnel for existing business and industry. Examples of this type of symbiosis abound; among the best known are the Route 128 corridor outside Boston (America's Technology Highway), a beltway of high-tech businesses, many of which were founded by the graduates of Harvard, MIT and the area's numerous other institutions; and Silicon Valley in California, which draws from that area's colleges and universities.

The Sasaki team is mindful of all of these issues and will approach the reuse planning process with an eye on their balanced resolution. The detailed scope of work that follows will provide the team with the technical understanding and market information it needs to formulate a reuse and development plan for Mound that will competitively position this important asset and will provide MMCIC and the city with the "road map" necessary to ensure a smooth transition from secret government research to productive private industrial operation.

Facilities Inventory and Assessment (URS Consultants)

Purpose:

To determine the viability for reuse of certain individual buildings at Mound and to assess the feasibility, including costs, of upgrading these and other facilities as appropriate, to comply with current building codes and ADA access guidelines. Develop a facilities plan which depicts proposed modifications to, or removal of, existing facilities, consistent with the preferred reuse plan for Mound.

Approach:

The key to performing the facilities inventory and assessment is to gather sufficient information on existing facilities to establish, for long-term planning purposes, whether or not individual structures should be retained as elements in a long-term reuse plan, and to establish the basis for estimating the cost of renovations for targeted future tenants or owners. It is critical that the inventory and assessment process be designed and conducted so as to minimize the expenditure of resources on structures or complexes of structures that are poor reuse candidates. It is assumed that up to 25 percent of existing buildings are candidates for removal.

Methodology:

Task 1: Establish Facilities Assessment Priorities and Prepare Inventory Survey Forms

The consultant team will review and assess the existing facilities data and inventory that already has been carried out by MMCIC. URS Consultants, in a work session with key members of the Sasaki team and representatives of the MMCIC, will identify those facility attributes and deficiencies around which the assessment process will focus. Priorities established at the work session will be used to weight criteria included on evaluation matrices to be used by field teams during the facilities inventory. The evaluation matrices will generate a weighted ranking for each of the 15 buildings (totaling 418,521 square feet) to be inventoried. Buildings which receive a score above a fixed value will be designated prime candidates for reuse; buildings scoring below a fixed value will be designated as demolition candidates; and those scoring in an intermediate range will be subject to further evaluation. As overall redevelopment concepts become more clearly defined, additional assessment and costing efforts may be identified for buildings in the intermediate range.

With finalized matrices in place, a comprehensive assessment of all building facilities will be developed and will include the following factors:

- Electrical Engineering
- Mechanical Engineering
- Structural Engineering
- Architecture
- Environmental Compliance

This comprehensive assessment will be prepared utilizing input of survey team members from each of the discipline areas and will include facility ranking matrices, building information extracted from existing data, open-ended questionnaire data documenting the results of interviews with EG&G building managers, and data recorded in the field by survey team members.

Task 2: Conduct Facilities Inventory

The inventory process will include the collection of available data through review of existing building documentation (e.g., CADD files, Field Information Management System/Mound FIMS Data). Field surveys of typical building facilities will be carried out to confirm existing information. Prior to the collection of field survey data, existing building information will be collected and distributed to each member of the survey team. This information will be used to partially complete the survey forms and orient survey team members to the individual facilities. We anticipate that in many instances, especially where existing building documentation is relatively current, the field surveys will result in simple confirmation of existing building data. After existing data is reviewed and recorded, field teams will survey individual buildings, interview building managers (recording their observations), then complete the evaluation matrix included on each survey form. Field surveys to confirm and supplement existing data will be limited in scope and budget as shown on the labor estimate.

Because the actual time required by the individual discipline will vary in each building, building evaluations will be scheduled by discipline rather than for the team as a whole. At a minimum, the following information will be obtained by the individual discipline groups:

- Architecture: General building character (e.g., high-bay steel frame), intended function, building code compliance (including ADA), current capacity, availability of convenient parking, street access, and buffer yard adequacy.

- Electrical Engineering: Type (including unique fixed equipment), condition and age of in-building systems, compliance with electrical codes, and level of electrical service available.

- Mechanical Engineering: Type (including unique fixed equipment), condition and age of in-building systems, compliance with electrical and HVAC building codes, level of utility service available, general assessment of energy efficiency.

- Structural Engineering: Type of structure, unique structural characteristics (high-bay crane, oversized foundations for expansion, or unique building functions), structural integrity, and compliance with structural building code requirements.

- Environmental Compliance: Conduct of building "audit" (not a Phase I, Site Assessment) to identify areas of probable environmental concern, including the presence of friable asbestos, lead-based paint and sub-grade contamination from regulated substances (excluding nuclear covered EG&G remediation contract).

During the conduct of the field surveys, biweekly meetings of the entire survey team will be held to evaluate progress and make adjustments to the schedule as required. In addition, each team member will meet with the EG&G building manager to obtain and document additional input pertaining to each discipline, as appropriate.

Task 3: Integrate Survey Data and Prepare Consolidated Facilities Assessment

Upon completion of field activities, the team's principal facilities engineer will integrate the data gathered by each discipline, establish a functional reuse rating by completing the facility ranking matrix included on each survey form, and prepare a draft of the Facilities Inventory and Assessment Report. This report will be reviewed by all members of the Sasaki team as well as members of the MMCIC. Upon receipt of comments, any necessary additional data will be collected and the final report will be prepared.

Products:

The output of the Facilities Assessment will serve as the primary input in the development of reuse alternatives and will consequently identify additional facility-specific analyses including cost opinions for building upgrades and/or adaptive reuse. The Facilities Assessment will result in a written report containing:

1. Comprehensive listing of all facilities and criteria utilized to evaluate them.
2. Documentation of field surveys utilized to confirm data.
3. Comprehensive database listing all facilities and showing those to be removed, reused in their existing condition, or requiring modification to meet market demand.
4. Planning-level recommendations for alternative methods to meet reuse and/or building code requirements.
5. Cost opinions for proposed improvements.
6. Overall site plan graphically showing buildings to be removed, buildings to be reused in their existing condition, and buildings requiring modifications.

Infrastructure Plan (URS Consultants)

Purpose:

To determine the viability of existing infrastructure systems (both utilities and roadways) to support the reuse/development plan for Mound, including an assessment of those components of the infrastructure system that can continue to be utilized, those that should be abandoned, and those systems that can be modified for integration with existing municipal or county systems.

Approach:

The approach to the Infrastructure Report is very similar to that employed in developing the Facilities Inventory and Assessment. The objective of the plan is to evaluate the infrastructure currently supporting facilities and operations at Mound, and to determine the extent to which it can support future on-site private sector development and at what cost.

Methodology:

Task 1: Establish Infrastructure Assessment Priorities and Prepare Survey Forms

A kick-off meeting will be held with key members of the Sasaki team and selected representatives of the MMCIC to discuss Infrastructure Report requirements. From this meeting, priorities will be established to serve as infrastructure evaluation criteria to be weighted in matrix format and incorporated in the field survey forms.

Task 2: Conduct Infrastructure Evaluations

Current information on the location and character of all on-site roadways and utilities will first be obtained, compiled, and input into survey forms prepared in the previous task by a designated member of an infrastructure assessment team.

The team will consist of the following discipline groups:

- Electrical Engineering
- Mechanical Engineering
- Civil Engineering

After existing data is incorporated on the survey forms, field surveys will be undertaken to confirm existing data. The following represent areas of unique interest for each of the discipline groups:

- Electrical Engineering: Location, capacity, age and condition of electrical and communications distribution systems including related appurtenances such as transformers and switchgear.

- Mechanical/Civil Engineering: Location, capacity, age and condition of steam and chilled water lines including related appurtenances such as booster pumps. Also included will be an assessment of boilers and chillers in the Powerhouse, as well as satellite chillers in Building 95.

- Civil and Site Engineering: Location, capacity, age and condition of water distribution, storm and sanitary sewer systems. The evaluation of these systems will include analysis of water towers, fire hydrants, manholes and other related appurtenances. The capacity of existing county and municipal water and sewage systems will be evaluated to determine specifically how and at what costs the Mound might be integrated into these systems in the future.

- Civil and Traffic Engineering: Location, description, dimensions, approximate capacity, and condition of existing roadways and parking areas. This will include key off-site roadways serving the site.

During the assessment of infrastructure components, biweekly meetings will be held to evaluate progress and make adjustments to the schedule as required.

Task 3: Integrate Survey Data and Prepare Infrastructure Report

Upon completion of field activities, the facilities engineer will integrate the data gathered by the team and prepare a draft infrastructure modification/abandonment plan utilizing the evaluation criteria previously integrated in the survey form. This Plan will be prepared to reflect and shape overall redevelopment alternatives. As such, it will also serve as the basis for determining a significant portion of overall site redevelopment costs. This Plan will be reviewed by all members of the Sasaki team as well as members of the MMCIC. Upon receipt of comments, any necessary additional data will be collected and documented in a technical report.

Products:

The technical report will include:

1. Listing of infrastructure systems and criteria utilized to evaluate them.

2. Completed matrices and field inventory forms.

3. Documentation of the assessment of the existing infrastructure systems showing those facilities to removed, retained as is, or modified.

4. Alternatives to meet reuse/development requirements (circulation plan, parking, site access, etc.).

5. Recommendations on alternative methods and systems to meet reuse/development requirements.

6. Cost opinions for recommended infrastructure improvements and new infrastructure requirements.

7. Overall site plan graphically showing existing facilities to remain, be removed, or be modified, and new systems that will be required.

Market Potentials and Economic Assessment (ERA)

Purpose:

To determine the market potential of the assets present at Mound, including the facilities, the vacant land, and the special technologies ("packaged" with key facilities); and to determine existing and future operating costs/revenues for the reuse/development plan. To identify sources of funding and strategies to address any identified deficiencies in long-term revenues vs. costs of implementing the preferred plan for reuse/development of Mound.

Approach:

The Miamisburg Mound facility is unique, but is likely to face many of the same problems faced by the military installations that are being converted to civilian use. It is commonly known that most of the military installations have not been moved through the process of conversion easily, and many fall short of the early objectives that are set. As the stakeholders in these efforts take a step back to evaluate the problems, many can define what has not worked and what the issues have been. Clearly, some of these are linked to the inertia of politics and others to the red tape that surrounds federal government real estate transactions. The Miamisburg community may have a significant economic development asset at the Mound, but before it can be considered such, it will require a well-conceived physical and economic/financial plan to carry out its transition to private use. Several steps must be accomplished as part of this broad program; those related specifically to the economic implications are:

- Preserve this potential asset for the community and region;
- Maintain the core labor force to ensure that the capabilities are available for new business development to tap for needed skills, and to keep these high technology jobs in the area;
- Use all the Mound and the adjacent site as tool for a broader economic development strategy;
- Ensure that operations of the facility are on sound financial footing and can "cash flow" after a realistic period of time;
- Set the stage for the ultimate privatization of the Mound after the Department of Energy involvement stops;
- Establish a competitive position for the new business park that will enable it to attract business by providing the amenities and features that are required in the marketplace.

In this present era of fiscal conservatism and budget constraints, the reuse of any type of property must be consistent with the dictates and characteristics of the market and economy. A private developer would look very carefully before taking on the financial responsibilities of converting a facility from federal to private use--as have investors around the country when they have evaluated military reuse possibilities. And many of the private uses on these facilities

have only occurred when the local community has "sweetened" the deal by offering enticements that ultimately created the opportunity to generate profits and minimize the risks. In fact, in many cases, the only reason that conversion was made possible was the heavy subsidy that was provided by the federal government. We have found that a number of community leaders have carefully evaluated whether an installation was either an asset or a "lemon". The successful programs are those in which the realities of economics and finance are key decision factors in defining the reuse direction. As a result, our approach in Miamisburg has incorporated these issues and will integrate them into the major aspects that define the reuse plan. Several of the more important elements of our goals are defined below:

1. The reuse plan will be market driven and the financial strategy sound so that the MMCIC is assured that the plan can be implemented.

2. The financial analysis will integrate market elements into the land valuation (appraisal) tasks so that the MMCIC is in a position to negotiate for the conveyance of the land under terms that are favorable to the community, and will ensure the viability of the operation.

3. The plan itself will base some of the physical recommendations on the market dictates so that the owner/operator of the facility is not saddled with buildings and facilities that have no real potential for private use and would carry an unmanageable operating cost burden.

4. Technology transfer recommendations will draw from previous research combined with our own evaluation of future opportunities to direct the marketing program toward technologies that have the greatest potential for growth and job creation in private industry. Likewise, the incentives program recommendations would be structured so that public incentives are maximized to the greatest extent to create investment and jobs.

5. Site plans and development recommendations will be structured so that the converted facilities in the developing business/R&D park can compete in the regional market. The economic research will determine what the market requires and weave these factors into the plan. This task will also weigh in the operations cost issue, which has the potential to "make or break" the conversion, given the current $9 million figure to operate the Mound. As a result, the plan will:

   - Determine what will be necessary to minimize the operating costs and support a development plan that maximizes "profits"; and,
   - Identify how the developed property can be marketed as a single entity in conjunction with the vacant business park to create economies of scale, and synergy and complementarity between the two.

6. The in-place Economic Development Plan will be further detailed and refined so that the envisioned elements are woven into the context of the reuse plan and the results are

amplified. The marketing plan and the financial incentives are aspects of the Plan that our team is including in its scope of services to ensure that the reuse plan is a tool through which prospects are identified and pursued as part of the comprehensive strategy, and the beginnings of tenant negotiations are started where it is possible.

7. Concepts in the reuse plan will be defined so that the MMCIC has the maximum access to federal and state programs that will be necessary if the project is to be successful.

8. All aspects of reuse will be considered in the context of the most feasible options--those which have the greatest chance of successful implementation. With this as the driver, the possibility of carrying out a seamless reuse and development plan will be greater.

9. Finally, each of the individual components of the overall planning process will be done with implementation in mind, building local capacity during the process and ensuring that the necessary elements for legal, administrative, land control and management are set in place at the completion of the assignment.

Methodology:

The tasks in this element of the work program will identify what activities and business development have the best chance of success at the Mound and the adjoining undeveloped land--those which will have market demand, generate adequate revenues to continue to support the privatization of the facility, and meet the community job and economic development alternatives. Throughout the task, the concepts will be evolved and tested to ensure they are ultimately feasible. Our product will rank order the alternatives and provide a discussion of the implications of implementation.

Task 1: Technology Transfer Evaluation

We will conduct an economic evaluation of the potential to convert existing Mound technologies (and related staff skills) into the commercial marketplace, and look into the opportunity to privatize some of the ongoing DoE needs for research, development and production at Mound. This task will build on the already-completed work by the University of Dayton and will include interviews of the key researchers to identify their perceptions. Further information will be collected regarding 5 to 10 of the most promising technologies by collecting research done by technical associations and technical articles published to forecast the future R&D and manufacturing opportunities that could be captured at Mound. We will interview employees, contractors and current Mound tenants to further test our findings. From this array of information, we will develop a profile of the industrial potentials that exist, developing conclusions concerning the appropriate SIC codes to be targeted and specific companies that may have need of either research capacity or space at the Mound. All data will be converted into a space development plan that will match facilities and equipment at the Mound. We will

determine the expected absorption of space and the time frame in which this would be likely to occur.

Task 2: Market Analysis

As indicated in the introduction, we envision the undeveloped land associated with the Mound as offering the potential to complement the activities taking place in the adapted DoE facilities. For example, the Mound itself is not likely to lend itself to intense manufacturing activities, warehousing or support services. We would further our work in Task 1 to determine the most economic mix of activities to target to the undeveloped site. This market analysis would also look to the regional development community to identify trends, growth and future direction within the business park real estate market. This task would inventory competitive facilities to identify demand, supply, product, tenanting, etc., and draw conclusions on the likely prospects for the undeveloped area of our site. The focus would be on complementary industrial markets, but also would consider office, hotel/conference, services and other types of development that would enhance the attractiveness and marketability of the entire site and help ensure a revenue flow that will be necessary to make the entire undertaking feasible. The inventory efforts will determine what market parameters exist that will define the revenue potential based on land sales in existing business parks and rents that are paid in speculative space. (This information can also be used to determine that land value for the appraisal product.)

This element of the work will also involve two other sub-tasks. First, we will evaluate what role the skilled and trained workforce will have in filling specialized job requirements to ensure long-term viability and marketing of the Mound. As an adjunct to this, we will look into the opportunity and the market need for a business incubator as part of the overall development and privatization concept, where a unique environment is established to provide start-up businesses a chance to grow and be nurtured.

Task 3: Market Testing

We will carry out a test market of approximately 25 potential technology industries to determine their potential interest, probable space needs, staffing expectations and requirements, capital and incentives needs, etc. Top prospects will be identified for further interface later in the strategy.

Task 4: Facility Recommendations

The market conclusions will be overlaid with the engineering assessment of the facilities to determine which of the buildings has potential to be used in the private market. Findings concerning space and equipment needs will be compared and contrasted with the Mound facilities to determine what types of retrofit will be needed to make the space competitive--to

adapt it from federal use to private use. These conclusions will be later incorporated into the financial analysis.

Recommendations will be presented concerning the development requirements necessary to facilitate the privatization plan, including the broad requirements for infrastructure upgrading or new development. This market-based information will be fed to URS for development cost-estimating purposes. Likewise, the elements concerning the site requirements that would be critical to develop a competitive business park will be given to Sasaki as a driver in the land-planning efforts.

Task 5: Funding Sources

The Sasaki team will identify the most likely outside funding sources to augment local capacity to develop and implement the physical elements of the conversion plan. This would build on the work that has already been prepared in the Economic Development Plan and focus on those that are most attuned to the objectives of reuse. Clearly, federal sources must be targeted and the Economic Development Administration would appear to be an excellent match. However, the future of EDA is in question and we would determine an alternative course of action if these federal funds are sent to the states in the form of block grants. Also, we will meet with state officials to determine where the MMCIC can best tap into state programs. Finally, we will judge whether such techniques as foreign trade zone, tax increment finance, or others would aid in the conversion.

Task 6: Alternatives Testing

We will prepare up to three development scenarios that will bracket the range of probable economic performance by making differing assumptions concerning market and industrial uses, the character of the development of the vacant land, alternative approaches to property conveyance/acquisition, differing levels of infrastructure investment and retrofit costs, etc. These will be tested on a first-cut cost-benefit analysis to serve as a reality check for the alternative scenarios. This will incorporate the findings of the technology transfer analysis, cost estimates from the physical planning, and the market conclusions. It will also build in differing assumptions concerning incentive requirements as well as the amount and type of financial assistance that will be available. The result will be a preliminary financial cash flow financial analysis that will translate the assumptions into hard number estimates that will show income and expense results from each of the scenarios. Once complete, we will have direction on which of the broad concepts appears to be most financially feasible. The implications of the alternative strategies will be explained to the MMCIC. Also included in this report will be results of a preliminary impact analysis which illustrate how each scenario will meet the economic goals and objectives of the community and affect its fiscal well-being. Jointly, we will refine the concepts to develop the market activities that will be incorporated into the preferred plan.

Task 7: Monitoring and Evaluation of Financial Performance

Implications of the reuse plan will be discussed in terms of alternative ownership scenarios and operating strategies, including control and public cost/fiscal considerations, the relative mix of private and public uses, etc. The methodology for evaluating and conducting sensitivity analysis will be explained so that as market dynamics shift somewhat or federal policy changes, their impact can be evaluated and the specific elements fine-tuned to capitalize on the changes or to ensure that there is no negative impact.

This will also enable the MMCIC to approach other local, state and federal players in the process to cement their relationships and better coordinate activities.

Products:

1. Technology transfer analysis which delineates industries and specific businesses to be targeted in formulating the comprehensive reuse/development plan and in marketing the MATC complex to industries and businesses.

2. Market analysis report which identifies trends, growth and opportunities within the industrial real estate market and in other sectors of real estate as may be deemed appropriate for the site during the planning process.

3. Market test report documenting responses regarding the attractiveness of Mound received from a telephone canvass of selected industries.

4. Report recommending a strategy for optimizing facilities at Mound required to support the preferred plan for privatization.

5. List of potential sources of funding to underwrite specific components of the comprehensive plan including as well a discussion of special techniques to enhance the market position (competitive advantage) of Mound.

6. Preliminary cash flow models for two alternative development/reuse scenarios showing expected revenues and expenses for a range of investment in infrastructure improvements and facilities upgrades.

7. Input into the overall performance monitoring and evaluation process as it relates to financial feasibility and the minimization of adverse fiscal impacts to the community and region.

Implementation Plan (ERA)

Purpose:

To develop a strategy for the implementation of the reuse and development plan in phases to manage capital investment in facilities, infrastructure and operations to levels that, to the extent practicable, are compatible with revenues created through privatization of Mound's land and facilities assets.

Approach:

The reuse of Miamisburg Mound will take place over a period of years. Even though market factors, technologies and other development parameters will change during this time, it is important that all the elements for implementation be carefully thought out, conceptualized and put into place before the implementation begins. The program for implementation must be closely attuned to the objectives and goals of reuse and the market parameters. Our tasks are directed toward putting in place all of the structure and activities for this longer-term process, ensuring that the legal, administrative and financial capabilities exist to carry out the program. This will draw from our experience in the development process for both the public and private sector.

The intention of our team is to ensure that the direction of a feasible and pragmatic reuse plan be fully detailed so that the necessary elements are in place to put the plan into action. In this phase, we would provide some detail regarding how the base reuse strategy can be implemented for the most successful results and in the most effective manner. This will include a phased action plan showing the details of what needs to be done to implement the recommended reuse strategy. The implementation plan will link into the broader community economic adjustment program, identifying ties to existing organizations, resources and programs. It will be step-by-step during the first five years and direction for the longer term, including opportunities for interim leases on the property prior to DoE's departure. We believe that an element of flexibility must be maintained to accommodate exciting future opportunities. Tasks include:

Methodology:

Task 1: Organizational Recommendations

We will make organizational recommendations for taking title to the property, for operating and developing the facilities, and for managing the long-term civilian operations at the Mound. The nature of the property transfer process and the business development plan will also influence the type of organization needed to manage the property successfully. In addition, we will define appropriate implementation policies and determine how these can be fine-tuned, as change occurs, to become more effective.

Task 2: Property Acquisition Plan

Our report will provide a Property Acquisition Plan for the facilities which will minimize long-term community acquisition costs. It is our anticipation that the conveyance of the Mound property will likely follow some of the public benefit conveyance features of the 1949 Property Act and the current legislation that has been evolving concerning military policy for the Economic Development Conveyance. Where possible, we will prepare an analysis of the phased "Interim Use Lease" arrangements under 10 US Code 2667 or the phased "Protection & Maintenance" requirements for civilian commercial activities, pending transfer/acquisition of the parcels. We will maintain regular contact with the key federal agencies, particularly the Department of Energy. We will also evaluate other acquisition elements such as bond-financed purchase or public bid. Here, it is our intention to help structure the conclusions of the valuation activities to ensure that a realistic fair market value is accounted for in the acquisition plan, given the major investment that is needed to make the property ready for reuse.

Task 3: Personal Property Strategy

The transfer of equipment and other personal property at closing *military* installations is under the legal provision of Enclosure III to the DoD Directive 5410.12 on Economic Adjustment; the Military Departments are required to leave equipment that is not "need-to-buy" and not "mission-essential" at the base as "related Personal Property." The equipment that is requested by the local community must be related to the specific proposed civilian uses in the community's Base Reuse Plan. The team will work with the DoE to determine how other federal policy will apply to Miamisburg Mound; we will also work with the local economic development specialists to identify the necessary operational and maintenance equipment and technical/testing equipment which should be requested, focusing on the "drawing card" type of property. (Clearly the "privatization"-related property will require the DoE's donation of key equipment for future technology research activity.)

Task 4: Real Property Appraisal

Under the direction of ERA, the team will prepare a valuation of the real property at Mound, both the developed environment and the vacant land. This work, under the signature of an Ohio-certified appraiser, will be performed using standard and accepted appraisal methodology. However, we believe that it is important to point out that this approach will be carefully tailored to the unique features and assets of Mound; for example:

- The vacant acreage can be valued using market comparable sales. Clearly, with the improvement of the economy there will be adequate activity in the real estate market to determine what bulk land sales have been for comparably zoned property. Appropriate adjustments will be made to account for the unusual or unique factors of the site.

- Valuation of already-developed space will be approached more carefully. It seems apparent from first analysis that it may be difficult to find comparable sales that can be used to define value, particularly after the parameters of reuse have been defined by the market. For example, if the MMCIC chose to implement a business incubator, the similar developments that have been implemented are owned by public and quasi-public entities and are often in older, retrofitted space. True comparables to Mound may not exist. Similarly, there are no other DoE research facilities in the Dayton regional market that have been sold. The space and the personal property which may be left in place (becoming real estate) has value that will be based on the return on investment vis-à-vis the costs that will be necessary to prepare the property for reuse. It is possible that this return will not exist in financial terms: the facility may only break even after the public and private investment is made. Rather, the return will be economic, jobs, and perhaps tax base. Thus, the income approach may indicate a non-existent value.

Our approach will determine the value in such a way that the financial interests of the community and MMCIC will benefit, and the property acquisition strategy can capitalize on the appraisal results.

Task 5: Business Plan

The business plan will integrate all the costs of reuse--infrastructure development, facility retrofit, management and staffing, financial incentives, labor training programs, incentives requirements, ongoing consulting and engineering, maintenance, legal and accounting, marketing, and other relevant costs--to determine over a period of years the annual costs of conversion. We will forecast the revenue stream from all sources including federal/state grants, bonding, property leases, property sales, etc. From this analysis, we can determine the cash flow gaps and the type of public/private partnership approaches that could be used to fill the gaps.

During the military base closure process, a member of the Sasaki team helped conceptualize the "caretaker" concept that has been implemented at many of the bases. The idea behind this is that the military service will pay the community to be their "contractor" to maintain the base while the military scales back its activities and implements the environmental cleanup. The authority at the community level and the DoD negotiate a fee whereby the locality is paid to maintain and heat the buildings, plow snow, cut grass, show the property to interim lease prospects, etc. In this way, the local leaders gain experience and knowledge of the facility, all the while receiving revenue for their efforts. The caretaker concept facilitates the transition and enables the marketing efforts to be implemented more effectively. We propose to pursue this idea with the DoE. (If DoE is amenable to this approach, we would provide recommendations on the structure of such an arrangement between MMCIC and DoE.)

Task 6: Financing for the Implementation and Economic Development Programs

We will develop the documentation needed for conversion capital. Because we specialize in joint public/private financing and partnerships, we can provide direction and detail on which specific funding sources, federal, state and private, would be most achievable for reuse. Prior to completion of this phase, these recommendations would be displayed in a table reflecting the most suitable sources for a reality check at the state level. The objective will be to make the Miamisburg Mound facility self-supporting after the DoE involvement disappears, but to ensure that any near-term finance shortfalls can be met.

Task 7: Action Plan and Chronology of Events

A detailed implementation action plan will be outlined so that it can be accomplished by local leadership ensuring that the concepts, issues and capacity are developed locally. It will be a step-by-step plan that shows the sequencing of activities which must have a logical progression of events and clear interrelationships. We will provide this outline and, where possible, show back-up approaches if some requirements fall through. Elements of this sequencing will be developed through our recommendations on what path the environmental remediation tasks will follow. Other pre-closure community actions including adoption of the land use plan, transportation programming, zoning amendments, and CCRs will be identified.

Task 8: Develop and Begin Initiating Marketing Plan

We will develop a Conceptual Marketing Plan which performs the following functions:

1. Identifies the specific strengths and any unique selling points of the site itself;

2. Carefully considers the attendant characteristics of the community at large, particularly how well the public and private sectors work together;

3. Targets businesses, industries and institutions that "fit," can capitalize on the site's attributes, and are generally compatible with the community at large;

4. Sets priorities for the targeting of activities; and

5. Begins to determine prospective tenants, start-up businesses, and possible new facility development so that interim leases and longer-term negotiations can be initiated. Our staff will take a hands-on role in this effort.

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Products:

1. Memorandum report concerning recommendations for taking title to the property.

2. Property acquisition strategy that minimizes the long-term costs to the community of the privatization of Mound.

3. A strategy for the transfer of "personal" property and other equipment that reflects the importance of this equipment to future technological reuse of Mound assets.

4. An appraisal of the real property at Mound, both the developed portions and the undeveloped land. This will include a commentary on how the value of the undeveloped land may be positively affected by its adjacency to MATC--the "synergy value."

5. A business plan that includes a pro forma analysis of the preferred plan, an identification of cash flow deficiencies, and recommendations concerning approaches to bridging these financial gaps.

6. Recommended strategies for supplemental funding to aid the transition of Mound from a GOCO facility to a private industrial park.

7. Step-by-step plan for community initiatives and actions required in support of the privatization of Mound.

8. Marketing plan that targets specific industries or other uses that have been identified as businesses that could benefit, in one way or another, from locating at Mound.

ansaction Assistance and Management (HR&A)

ırpose:

'o facilitate the transfer of Mound to the MMCIC and thereby expedite the privatization ırocess.

The driving force behind the plan for the reuse of Mound is economic development and technology transfer. However, it is important not to overlook that, in order to achieve these goals, real estate will have to be transferred, assets will have to be managed, and financing will have to be obtained. While these aspects of the planning and implementation process are ***means to an end***, rather than an end in themselves, they represent critical steps which must be taken in meeting this economic development challenge.

Task 1: Transactions

Phasing and parcelization will have implications for the negotiations with DoE regarding land disposition. While DoE has independent authority to dispose of property through a negotiated ·ocess with the community, it is essential that plan implementation be informed by the ımmunity's rights and obligations with regard to assuming the property. Negotiations with DoE, for both interim uses and long-term disposition, will be an integral part of the implementation strategy. The implementation plan will have to take into account environmental cleanup and infrastructure investment along with economic development priorities in preparing a disposition plan. The consultant team will provide active liaison with DoE and strategic advice to ensure that the community's priorities are respected and that the plan fully accounts for the range of possibilities with regard to land disposition.

The MMCIC will need to establish its own set of land disposition processes. It is essential that the MMCIC achieve tangible success in the short run to meet project scheduling and build public and political credibility for long-term strategic success. To accomplish this, it will be necessary to accommodate changing market conditions and fiscal environments. The consultant team will assist the MMCIC in determining its land disposition mechanism(s).

Task 2: Management

Although the MMCIC seeks its own extinction within a ten-year period, for at least that period of time, the MMCIC will essentially be one of the region's largest real estate companies. With over 1.3 million square feet of buildings and over 300 acres of land under its control, the MMCIC will be asset manager, land developer, funding vehicle and key actor in the setting and achieving of regional priorities. The consultant team will assist the MMCIC in evaluating its management options to ensure that each of these functions can be carried out directly or contracted out in the most efficacious manner possible. As it is also possible that full site

development will not occur within the ten-year time frame, the consultant team also will discuss various options for the MMCIC beyond the ten-year time horizon. Inevitably, there will be some trade-offs between the need to dissolve the MMCIC and the desire to maximize the long-term value of the land. We will quantify and clarify the available options.

The ten-year operating pro forma which will be developed by ERA will show various gaps in capital and operating revenues such that some public subsidy will be necessary. We will identify the appropriate federal, state and local subsidies, along with appropriate levels of each subsidy. Part of our commitment to the MMCIC is to partially vest these recommendations with the respective authorities in order to ensure that our recommendations are realistic and reasonably active.

Products:

1. Recommended land disposition strategy.

2. Identification of potential sources of "gap" financing.

Land Use Plan (Sasaki)

Purpose:

The purpose of the land use plan is to formulate a scheme for guiding the development and redevelopment of Mound in a manner that is compatible with the MMCIC's goal of achieving an economically viable, privately owned industrial park at Mound within ten years. The land use plan will "flow" from the economic and market analysis and will respond to three key factors: 1) development limitations resulting from facilities, infrastructure and environmental conditions extant at Mound; 2) the sequence by which the property is scheduled to be released by DoE to MMCIC; and 3) the need to minimize the costs of on-site infrastructure (roadways and utilities) improvements and off-site fiscal impact of the transfer of Mound to the community.

Methodology:

Task 1: Conceptual Alternatives

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In order to bracket the range of land use options available at Mound and to help identify issues affecting the attainment of the goals for Mound reuse that have been set out by MMCIC, the land use planning process will present three conceptual alternatives for reuse and redevelopment of the site. Accompanying the three conceptual land use alternatives will be conceptual schemes for phased improvements to roadways and utilities required to support each of the alternative land use schemes.

The conceptual alternative land use schemes will be based on an analysis of the development opportunities and constraints present at Mound. This assessment will synthesize information on soil conditions, slopes, wetlands and floodplains, environmental contamination, vegetation and habitats, regulatory requirements, required safety arcs, on-site facilities and easements, abutting land uses, and other relevant factors to produce an analysis of the Net Useable Land Area (NULA) at Mound. This analysis will be combined with the results of the facilities assessment and market analysis to identify those areas at Mound that are appropriate for development.

The land use plan, which will be based on the results of the economic and market analysis, will allocate land use types at the site in quantities consistent with their forecast market absorption over a ten-year period. The plan will indicate the location of land uses on the site as well as the general phasing of development and the sequence of infrastructure (utilities) and circulation (roadways and pedestrian routes) improvements, both on- and off-site, required to support the development/reuse program. The conceptual land use plans also will consider the sequence by which the property is made available to MMCIC following its environmental remediation. Generally, the property will be released to MMCIC in a south-to-north direction, the

undeveloped 124 acres being the first portion of the site that comes under full control of MMCIC by the end of 1996.

In addition to providing for the reuse of, and complementary development related to, Mound technologies, the alternative land use plans will address needs for community uses, opportunities for the development of educational facilities, provisions for open space and recreation and other compatible uses of the site, as appropriate.

The alternative concepts for Mound reuse and development will reflect also the land use planning implications of the options for its private ownership in the future, these options being:

1. Entire site is sold to a third party who then develops, operates and leases/sells the property;
2. Site is subdivided into several lots (some with and some without buildings) which are then sold to third parties;
3. A condominium is created with the facilities being sold to third parties and the land, primary infrastructure, and roadways being held in common.

(For example, for Mound to be sold in separate parcels to third parties, selective removal of several buildings may be necessary in order to permit the creation of legal lots and provide land area adjacent to specific structures which can be developed for employee/visitor parking. Whereas, were the property to be sold and managed as a condominium, it might not be necessary to remove any additional facilities since, under the provisions of a condominium, all buildings could sit on a single lot and the continued operation of the shuttle parking lot would be possible, with the lot being part of the common area of the condominium and the operation of the shuttle service being subsidized by the property owners through a condominium association. The costs to individual property owners for the shuttle service would be based on the number of each company's employees using the service.)

Each of the conceptual reuse/development plans for Mound will be accompanied by a preliminary analysis of potential off-site impacts sufficient to permit a relative comparison of the alternative concepts. These assessments will include, but not necessarily be limited to, estimates of peak hour and daily traffic (split between passenger vehicles and heavy trucks), water damage, sewage flows, induced population growth (number of households, total population, school-age children), potential tax revenues (real estate, sales and income) at build-out, fiscal impacts (esp., education, fire and police protection, and other public services), light glare, probable risk-hazard, land use compatibility with adjacent properties, and other considerations bearing on the selection of a preferred plan.

Task 2: Preferred Plan

The alternative reuse/development concepts will be evaluated and compared for market feasibility, financial feasibility, fiscal and environmental impacts, and quality of life considerations by the MMCIC.

By coordinating with Mound Reuse Committee (MRC), the concepts will be presented in public forums in order to receive public comments and suggestions concerning the community's preferred direction for reuse and development at Mound.

Based on comments received from MMCIC, which comments will reflect MMCIC's consideration of public comments and recommendations received during the public participation process, a preferred reuse/development plan for Mound will be developed. This land use plan could be one of the three initial concepts as presented, or a hybrid of two or more of the concepts incorporating additional recommendations of MMCIC.

The preferred plan for reuse/development, which will be defined in more detail than the initial concepts, will be documented in graphic and narrative formats as a major task of the comprehensive plan document.

Products:

1. A Net Useable Land Area (NULA) analysis of the Mound site, at 1" = 200' or larger, showing areas in which development is constrained for one reason or another and areas suitable for reuse/development.

2. A minimum of three conceptual land use plans illustrating, at a scale of 1" = 200' or larger, the allocation and quantity of land uses by building and land sub-unit within the Mound property, vehicular circulation and open space. Each land use concept will include a statistical summary indicating total quantity by use type, number of parking spaces and open space.

3. Alternative options for off-site access and entry to the property, summarized along with their probable impacts.

4. A phasing diagram related to each conceptual land use alternative, each diagram indicating the sequence of development and the phasing of roadway and utilities infrastructure improvements required to support development.

5. A preliminary status financial pro forma comparing the anticipated revenues from sales and leasing and infrastructure investment over the ten-year implementation period of each of the development plan options.

6. An assessment matrix including objective and subjective criteria as a means to assess the alternative plan concepts.

7. For the preferred development concept, a land use plan and an illustrative plan at a scale of 1" = 200'. The illustrative plan will show buildings, parking, vehicular circulation, open spaces and a landscape concept.

8. Minutes of all meetings including documentation of all public presentations of the land use concepts for Mound.

Site Plan (Sasaki)

Purpose:

The purpose of the site plan is to develop a site market analysis, design guidelines, and building standards based on the proposed land use plan.

Methodology:

Design guidelines will be developed in order to ensure that the reuse and development at Mound is implemented in a consistent, high-quality manner. Design guidelines will address building height, massing and lot coverage (i.e., floor area ratios, FARs); site grading and drainage; construction materials; landscaping and irrigation; visual screening; signage; lot development and building siting; lighting; and property maintenance and security requirements. Companion use guidelines will address potential nuisances such as noise, air emissions, and delivery scheduling; and potential health and safety risks such as use, storage, and delivery/shipment (both frequency and routing) of hazardous materials. In order to avoid any duplication of existing development requirements and regulatory controls, the adequacy of all existing codes and guidelines applicable to uses and development at the site will be evaluated as the first step in the process of preparing the site plan requirements. While they will ensure a high-quality business/industrial park that is a "good neighbor" to abutting properties and the host community in general, the guidelines developed to regulate the reuse and development of Mound will be carefully crafted to ensure that development requirements at Mound are competitive with those of competing industrial locations in the region.

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Design guidelines will be prepared in a format suitable for their incorporation into state and/or local zoning and planning regulations and building codes, as appropriate. In no case shall the design and use guidelines for Mound be any less restrictive than controls applicable to the site and already in place at the federal, city, or state level.

Alternatively, design and use guidelines can be incorporated in the form of deed restrictions/lease provisions whereby they "run with the land" and are implemented as a condition of the sale or lease of the properties at Mound.

Products:

1. Design and use guidelines for the reuse and development at Mound in format(s) suitable for incorporation into local and state laws and regulations, as appropriate. (Note that, because it may not be possible to bring the existing roads and buildings at Mound into full compliance with existing or proposed design guidelines for new development at the site, the design guidelines pertaining to the redevelopment of existing facilities and infrastructure at Mound may vary from those applicable to new development on the 124

acres south of the hilltop. Design guidelines/construction standards for the rehabilitation of the developed hilltop at Mound, however, will ensure that the building and site improvements in this area of Mound are compatible with the requirements for development and construction in the southern section of the site.)

2. A technical memorandum summarizing design guidelines for the Mound, including guidelines for architecture, landscape, open spaces, pedestrian and vehicular circulation, lighting, signage, stormwater management and a concept for security.

Monitoring and Evaluation (Sasaki)

Purpose:

To specify a methodology and criteria for evaluating the performance of the reuse/development plan for Mound, and to identify actions to be implemented to "correct" problems, including modifying and reformulating goals, objectives, or policies as may be necessary and appropriate to improve performance.

Methodology:

The consultant team will identify the critical parameters that are the measures of performance of the plan. These will include, but are not necessarily limited to, performance measures linked to: job retention/creation (total employment); payroll size; real estate values/tax revenues; operating costs (on- and off-site); fiscal effects (schools and other municipal services); etc. Actual results will be charted and compared to goals in each category to determine where the plan is attaining targets and where shortfalls are evident.

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Areas of target shortfalls will be evaluated to determine what factors may be contributing to goal attainment problems. Recommendations will be formulated for modifying the plan to achieve initial goals, or for modifying specific goals, objectives, or policies to correct identified problems. Special attention will be accorded any unforeseen problems or events that can be seen as contributing either to problems, or to results in certain categories that are exceeding expectations. These situations will be analyzed to determine if there are unique opportunities from which the Mound could benefit, or if there are challenges/obstacles that warrant special planning actions.

To ensure that the monitoring and evaluation program is an effective means of managing the implementation of the reuse/development plan, it will be developed as a dynamic tool which can provide a real-time "snapshot" of the plan's progress at any time during the ten-year implementation period. This approach will provide an early warning system for the presence of problem areas or obstacles limiting the potential for Mound. It will also help to identify market sectors that are stronger than had been anticipated, or specific market opportunities that were not foreseen at the time the plan was initially formulated. In this way, the monitoring and evaluation program can help guide the on-going direction of the evolving market circumstances such as might arise with a breakthrough in one of the technologies anchoring the MATC.

Products:

1. List of the criteria that are to serve as the measures of the Mound reuse/development plan's performance as it compares to the goals and objectives set for the plan at inception.

2. Narrative description of the data and other information that is required to adequately document the plan's performance as it relates to each of the criteria. This will include a discussion of the data and information required to reasonably monitor changes effected by the implementation of the plan (for example, the type of information that is necessary to track trends in the local school-age child population, and consequently demands on the school budget, brought about by shifts in the general population resulting from employment changes at Mound).

3. Recommendations regarding effective tools for tracking the progress of the plan, and recommendations concerning responsibilities for reporting this information to MMCIC will be provided. These recommendations could range from a chart on which progress against goals is plotted as a series of data points, to periodic written reports with accompanying analysis, or some combination of techniques. The thrust of these recommendations will be to ensure that MMCIC is equipped with a monitoring and evaluation procedure that is reliant only on readily available, high quality information, and that the responsibility for reporting is clearly defined and frequent enough to ensure that the MMCIC can react swiftly to changing circumstances.

Public Participation (ET&C)

Purpose:

To ensure active public participation in development of a successful reuse plan for Mound.

Methodology:

The Public Participation Plan presented below has been designed to encourage and stimulate public participation in the site reuse planning process. The public will be drawn into the planning process early on in an effort to gather community ideas, values, concerns, priorities, and other input to the process. Later, the public will be asked to consider the merits of various reuse alternatives or options under consideration. Concepts will be tested for public acceptability. The public also may be asked to periodically consider the merits of the plan in light of various local, regional or state planning processes, and any amendments to the comprehensive reuse plan that may be necessary.

Task 1: Public Notice/Public Opinion

The media, residents, and community leaders will be informed regularly about progress in developing the comprehensive reuse plan. New information from the study for public consideration, or announcements about planned public meetings designed to gather public input, will be integral to the plan.

At the beginning of the project, the consultant team will conduct demographic research in the Miamisburg community to learn more about the characteristics of the community, and to identify the key opinion leaders and stakeholders. Some, such as Mayor Church and Sharon Crowdrey, have already been identified. Other potential opinion leaders or stakeholders could include religious leaders, teachers, business owners, realtors, and neighborhood association leaders.

A small public opinion survey will be designed and distributed to the residents of Miamisburg to collect their thoughts and experiences relative to the Mound, its history, its impact on their lives, and their vision of its future. Information gleaned from the survey describing community values and concerns will be provided to the team as constructive input into the reuse plan.

As part of the team's strategy for keeping the public informed, representatives of the team will be available to prepare and distribute the press releases, fact sheets, and background documents. Two information flyers and at least one brief questionnaire designed to stimulate public input on reuse of the Mound will be developed and distributed. These will avoid the technical jargon and occasional vagueness that reportedly has hindered the usefulness of past releases issued by

DoE/EG&G. Timely public service announcements for public meetings will appear in print and on the local electronic media.

Task 2: Public Meetings

A "kick-off" public meeting will be held at the beginning of the project to inform the public about the nature of the study, and to request citizen input as the study proceeds. The public will be told about the goals of the study, and the types of opportunities that will be available for public input. The consultant team will prepare agenda, "hand-outs" (as appropriate), and minutes of all public meetings.

A second public meeting will be held to receive comments on the draft comprehensive reuse plan. Prior to this meeting, the draft plan will be made available for public inspection and review at the Miamisburg Senior Center and the Miamisburg Public Library. The meeting will include a formal presentation of the findings and recommendations of the study, and an opportunity for the public to ask questions and offer comments.

In between the two formal public meetings described above, informal meetings may be held with stakeholders and public opinion leaders to learn about public attitudes toward the Mound, to elicit information about public concerns toward possible reuse options, and to get input on potential impacts of redevelopment such as increased traffic, noise, or environmental emissions.

Task 3: Public Comments

A working strategy for making sure that there are timely opportunities for the public to voice its opinion, in writing, will be developed. Input from the community will be sought as options and alternatives are developed by the team. Public notices will be placed in the local paper, in the DoE newsletter, and in other public places such as the library or senior center, advising the public about opportunities to submit written comments, the options or alternatives to be considered, and the factors to be evaluated.

Responses to written public comments by the consultant team will be in accordance with the formal procedures for public participation adopted by the MMCIC. All written comments will be recorded and presented to the MMCIC for review and response.

Task 4: Response to Public Comments

The consultant team will address all public comments recorded in the minutes of public meetings and received in writing. Responses to comments will be made available for review in the public library and the senior center, among other potential locations. Anyone who submitted written comments will receive a written response from the consultant team. All responses will be reviewed with MMCIC prior to distribution.

Products:

1. Public opinion survey with a summary analysis of the results.

2. Four press releases, two fact sheets, two flyers, and four public notices/advertisements.

3. Minutes of all public meetings.

4. Compendium of and responses to all written public comments recorded during public meetings.

Schedule (Sasaki)

Following is a bar graph schedule for the execution of the work program described herein. Also attached is a summary of trips, their dates and the agenda for each.

The duration of the project will be 28 weeks divided into four work phases, each with a discrete set of tasks and products.

The first phase, *Due Diligence*, is a 6-week or 45-day period during which all team members will focus on critical issues that may affect the reuse plan. At the end of this phase of work, meetings with the MMCIC and stakeholders will review findings and assure the overall direction the plan will take.

Analysis and Review Alternatives is a 10-week task during which alternative approaches to the plan will be reviewed, concluding with a series of meetings at which a preferred alternative will be selected.

Final Plan Preparation is an 8-week task during which the selected plan is developed and concludes with a series of meetings at which the final plan is presented.

Final Documentation is a 4-week phase during which minor clarifications or modifications are made to the plan documents and the final document is prepared. At the completion of this phase, final presentations are made.

Comprehensive Re-Use Plan for Miamisburg Mound Plant
Schedule

Phase of Work	Trip Number	Agenda for Worksession with MMCIC	Meetings with Stakeholders and other Constituent Groups	Duration	Week of Meeting
A. **Due Diligence** 7 Weeks	1	• *Kick-off* • *Goals-directions* • *Needs & Issues* • *Data gathering and site reconnaissance*		3 days	1 April
	2	• *Present Initial Concepts* • *Confirm Alternatives*	**Stakeholder Meeting** to review findings **Public Meeting** to Introduce the team describe issues and receive initial input	2 days	13 May
B. **Analysis and Alternative Review** 10 Weeks	3	• *Review and Confirm Analysis* • *Development of Alternatives* • *Additional data gathering and site reconnaissance*	**Stakeholder Meeting** to review analysis and alternatives.	3 days	10 June
	4	• *Present Developed Alternatives (day 1)* • *Select Preferred Alternative (day 3)*	**Stakeholder Meeting** to review alternatives (day1) **Public Meeting** to review and solicit feedback on alternatives (day 2)	3 days	22 July
C. **Final Plan Prep** 8 Weeks	5	• *Present final plan (day 1)* • *Review comments confirm modifications (end of day 3)*	**Stakeholder Meeting** to review the plan (day1) **Public Meetings** - Present plan to 12 groups (days 2 - 3)	3 days	16 Sept.
D. **Final Documentation** 4 Weeks	6	• *Deliver final plan*	**Stakeholder Meeting** to present Final Plan **Public Meeting** to present Final Plan	1 day	14 Oct.

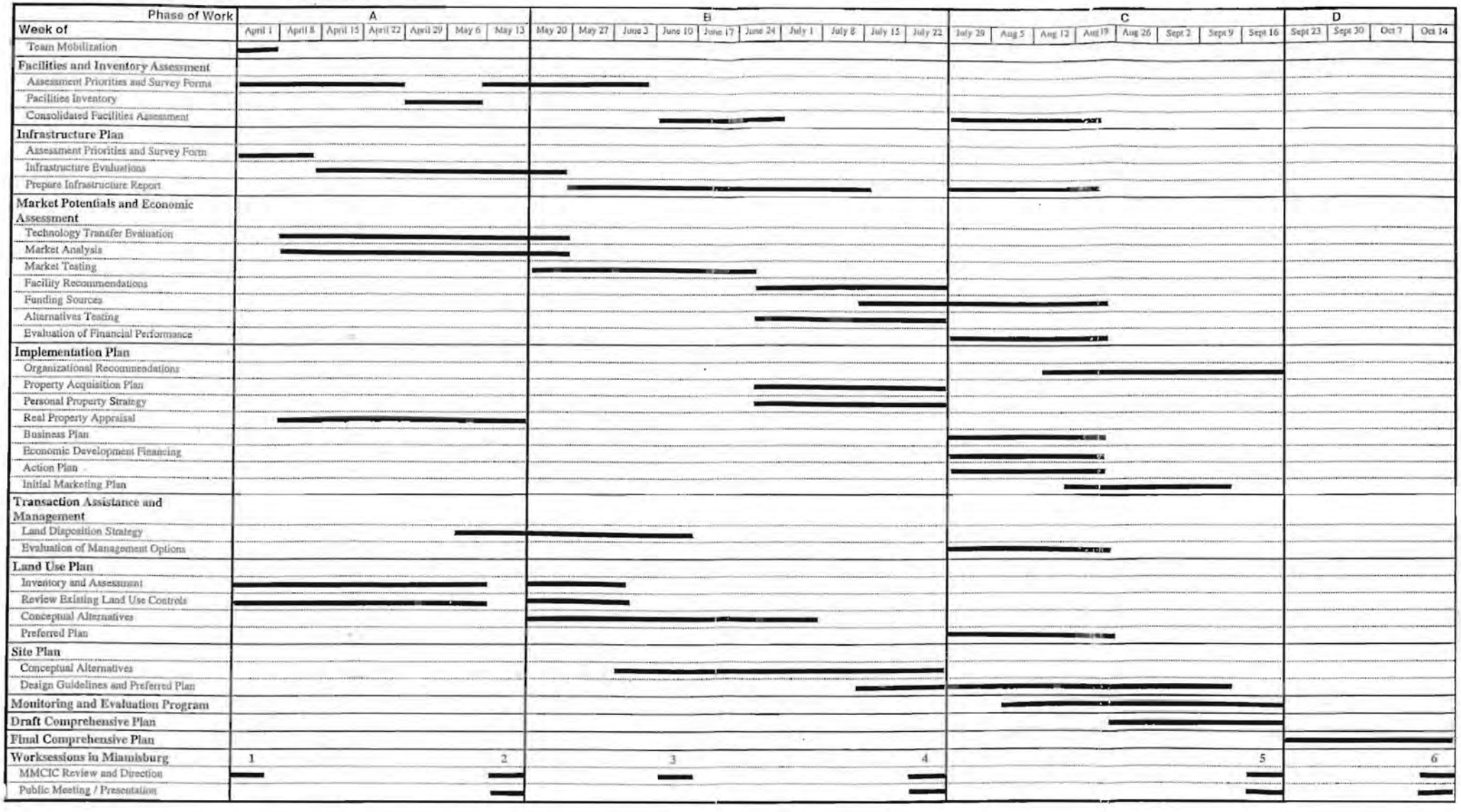
Summary:

6 Worksessions with the Client Working group - MMCIC. (EG&G - DOE - access through MMCIC)
4 Public Meetings open to the general public and announced through invitations and media.
5 Stakeholder Meetings which include the Mayor, etc. (MRC)

MIAMISBURG MOUND COMPREHENSIVE RE-USE PLAN
1996

MONTH	One	Two	Three	Four	Five	Six	Seven
PHASE	Phase A Due Diligence		Phase B Definitive Analysis & Conceptualization of Alternatives		Phase C Final Comprehensive Plan		Phase D Plan Documentation
TASKS	• Preliminary Facilities & Infrastructure Assessment • Technology Transfer Assessment/Interviews • Preliminary Market Assessment • Prepare Development Concept • Prepare Financial Assessment		• Facilities Assessment • Infrastructure Planning • Market Testing • Facilities Recommendations • Land Use Plan Alternatives • Gather/Review Existing L.U. Controls • Site Plan Alternatives		• Synthesize Alternatives to a Preferred Plan • Refine Phasing • Refine Cost Estimates/Financial Pro Forma • Identify Monitoring and Evaluation Criteria • Prepare Final Site Plan and Controls • Develop Implementation and Marketing Strategy		• Prepare Final Plan & Report • Prepare Final Monitoring and Evaluation Process • Final Implementation Strategy
CLIENT AND PUBLIC MEETINGS	Kick-off Work Session • Review Goals & Direction • Identify Needs & Issues Work Session #2 • Present Development Concept • Confirm Next Steps Public Meeting 1 • Introduce Team • Describe Process & Schedule • Engage Participation by Public		Work Session #3 • Present Results of Assessments • Identify Conceptual Alternative (s) Public Roundtable 2 • Progress Report • Ideas & Comments	Work Session #4 • Review Alternatives • Eliminate/Consolidate Options Public Roundtable 3 • Progress Report Public Roundtable 4 • Present Concept Alternatives • Receive Comments	Work Session #5 • Select Preferred Plan Public Roundtable 5 • Progress Report		Work Session #6 • Confirm Preferred Plan • Confirm Documentation Requirements Public Meeting 6 • Present Final Plan & Implementation Strategy
DELIVERABLES	• Re-Use/Development Strategy • Preliminary Development Concept (s)		• Preliminary Inventory Results • Planning Issues • Preliminary Technology and Market Analysis • Detailed Facilities Inventory and Assessment • Environmental Resources Assessment • Land Use Assessment • Economic & Market Assessment • Financial Reuse Feasibility	• Conceptual Land Use Plan (s) • Conceptual Utilities and Circulation Plan (s) • Conceptual Site Plans	• Preferred Land Use Plan • Preferred Infrastructure Plan with Costs • Phasing Schedule • Implementation Plan		• Site Plan & Design Guidelines • Facilities & Site Appraisals • Monitoring & Evaluation Process

Comprehensive Re-Use Plan for Miamisburg Mound Plant: Schedule



Sasaki Associates, Inc.
March 21, 1996

EXISTING MOUND VISION STATEMENT

Mound will remain a valuable contributor to the technological, economic, educational and social well-being of the Miami Valley and the Midwest. The site will represent a governmental presence and a vibrant partnership working in concert to promote energy, environment, manufacturing, research, and technological competitiveness for the commercial marketplace.

This vision statement manifests itself in the Mound Advanced Technology Center. The goal is that future Mound campus will be comprised of **multiple commercial businesses**based upon technology **brought together by synergy** and will contribute to the economic health of the community.

Source: MOUND ECONOMIC DEVELOPMENT PLAN
September 1994

MMCIC VISION STATEMENT

The vision is to have an economically viable privately owned business park in 2005.

SOURCE: MMCIC STRATEGIC PLANNING SESSION
AUGUST 1995

MIAMISBURG MOUND COMMUNITY IMPROVEMENT CORPORATION MISSION STATEMENT

It is the purpose of the City in having designated the Corporation as its agency for industrial, commercial, distribution, and research development, and the purpose of the Corporation in accepting and agreeing to act under such designation, **to create or preserve jobs and employemnt opportunities and to improve the economic welfare of the employees of the Mound Facility and the people of the City and of the State of Ohio** by exercising through the Corporation as the agency and instrumentality of the City, the power granted to the City by law, **to encourage and cause the maintenance, location, expansion, modernization and equipment of sites, buildings, structures and appurtenant facilities for industrial, commercial, distribution, and research activities within the Mound Facility** for the preservation of the public peace, property, health, safety, morals and general welfare of the City. In order to accomplish such purposes, the Plan is hereby established and the Corporation does hereby agree to participate in the Plan and carry out its provisions as the agency of the City for industrial, commercial, distribution and research development in the Mound Facility.

Source: City of Miamisburg/MMCIC Agreement
May 1994

Mound Reuse Committee

Charter

The Miamisburg Mound Reuse Committee (MRC) is a nonpartisan, broadly representative, independent advisory organization with concerns related to the future use of the Department of Energy's Mound Facility located in Miamisburg, Ohio. The primary mission of the MRC is to provide informed recommendations and advice to the Mound Community Improvement Corporation, the City of Miamisburg, and to other government entities on major issues and decisions related to transition activities. The major focus of the MRC will be on efforts to reuse, redevelop and commercialize the Mound Facility's buildings, equipment, and property while protecting the environment and maximizing the human, technological, and research opportunities that exist at the Mound. The MRC is dedicated to ensuring meaningful, timely and effective involvement of the public and key stakeholders in decisions regarding the future use of the Mound.

CONGRESSMAN TONY HALL'S
NEWSLETTER

WASHINGTON OFFICE—1432 LONGWORTH OFFICE BUILDING, WASHINGTON, D.C. 20515—(202) 225-6465
DAYTON OFFICE—ROOM 501, 200 WEST SECOND STREET, DAYTON, OHIO 45402—(513) 225-2843

VOL XVII DECEMBER 1995 NO. 1

House Passes Legislation by Hall to Speed Up Mound Cleanup

The House of Representatives approved a measure by Congressman Tony Hall to require the Energy Department to speed up the cleanup of nuclear weapons production sites such as the Miamisburg Mound plant.

The legislation is aimed at the twin goals of saving taxpayers' dollars and creating jobs.

By speeding up the cleanup at some sites, the Energy Department can dispose of the property more quickly, dramatically reducing the overhead costs that would be required by holding onto the property.

Also, by disposing of the property sooner, the facilities can more quickly be shifted to productive commercial activities.

The Energy Department estimates it can save $1.1 billion and cut in half the time to clean up the Mound plant through an accelerated cleanup schedule.

"We need to cut down the time it takes to get the Mound site into commercial use to create jobs. We want to move the property from being a drain on taxpayers to being a source of taxes," Hall said.

Miamisburg Mayor Dick Church, Jr. has been pushing a proposal to accelerate the cleanup at the Mound plant. The proposal is supported by resolutions adopted by both the Ohio Senate and House, the Board of County Commissioners of Montgomery County, and other government and private organizations.

Congressman Tony Hall with Energy Secretary Hazel O'Leary at the formal opening of the Energy Department's Ohio Field Office in Miamisburg.

CITY OF MIAMISBURG ROLE

As the lead transition entity, in order to facilitate widespread public involvement guided by strong economic development leadership, the City of Miamisburg has established two organizations:

> The Mound Reuse Committee (MRC) was established in order to develop a consensus on issues related to reuse and redevelopment of the site through the fair and open input of the stakeholders.
>
> The Miamisburg Mound Community Improvement Corporation (MMCIC) was established to administer and implement the economic development activities, programs, and plans of the transition effort.

Source: MOUND ECONOMIC DEVELOPMENT PLAN
September 1994

THE MOUND REUSE COMMITTEE (MRC) ROLE

The MRC will protect the long-term interests of the community and the region. It will serve to:

Establish a policy framework for the reuse of Mound facilities and assets.

Monitor the environmental clean up efforts.

Support activities designed to enhance a viable economic base and maximize the future opportunities available to the work force.

Source: MOUND ECONOMIC DEVELOPMENT PLAN
September 1994

THE MIAMISBURG MOUND COMMUNITY IMPROVEMENT CORPORATION (MMCIC) ROLE

In striving to commercialize the site, the MMCIC will:

- Market Mound assets to the private and public sectors.
- Negotiate and execute business agreements with the private and public sectors for the reuse of Mound assets.
- Maximize the human, technological, and research opportunities that exist at Mound.

Source: MOUND ECONOMIC DEVELOPMENT PLAN
September 1994

Miamisburg Mound Comprehensive Reuse Plan

Due Diligence Report

Prepared for:
Miamisburg Mound Community Improvement Corporation

Prepared by:
Sasaki Associates, Inc.

in association with
URS Consultants
Economics Research Associates
Hamilton, Rabinovitz & Alschuler
Environmental Technologies & Communication

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Section 1 - Site Assessment

Introduction

The Miamisburg Mound Plant is situated on a 306 acre site within the City of Miamisburg, Ohio. The original site, comprising 182 acres, was acquired by the Atomic Energy Commission (AEC)in 1946 to build the AEC's first permanent nuclear production facility. In 1981, the Department of Energy (DOE) acquired an additional 124 acre tract of land to the south of the original parcel. Over the past 50 years the original 182 acre tract has undergone substantial development, while the south portion of the site has remained undeveloped, being used as a buffer zone for the plant. Currently, there are over 100 buildings within the northern 182 acre area which have a total gross floor area of roughly 1.3 million square feet.

Regional Context

The Mound is situated on east side of the Great Miami River Valley the on the southern edge of the City of Miamisburg and is approximately ten miles south of the Dayton city limits (see figure titled Regional Context and Transportation and Access). For the most part Mound does not have any strong physical or visual linkages with the city of Miamisburg nor does the site have direct access to the principal thoroughfares (Route 725 and the Dayton-Cincinnati Pike) which serve the community. Land uses surrounding the Mound are noticeably different than the manufacturing/industrial uses located on the site. For the most part the developed property surrounding the plant is used for residential purposes. Undeveloped properties in the area include the municipal golf course and agricultural land to the south of the site. Although there are no plans for significant changes to the land use pattern in the area, it is possible that recent commercial/industrial development several miles east of the site on Benner Road near Interstate 75 could extend west toward the Dayton-Cincinnati Pike.

Land/Building Use

For planning purposes the site has been divided into six districts (Main Hill, Lower Area "A", Lower Area "B", Test Fire, SM-PP and the Undeveloped Land) which roughly correspond to the land uses within these districts (see figure titled Site Districts and Existing Building Use).

The Main Hill	50.3 Acres
Lower Area "A"	36.5 Acres
Test Fire	25.6 Acres
Lower Area "B"	13.1 Acres
SM-PP Area	40.4 Acres
Undeveloped Land	140.1 Acres

The **Main Hill** is essentially the historic core of the site where much of the early development was concentrated. Nearly 75-percent of all the development at the Mound is located on the Main Hill. Buildings on the Main Hill incorporate a wide range of uses including office, research, maintenance, and manufacturing.

Lower Area "A" houses roughly six-percent of the total building space at the Mound. These uses are limited to service and support functions such as the main distribution building, fire station, and warehouse facilities.

The **Test Fire** area is bisected by a stream valley which is paralleled on either side by roads which lead to the Lower Area "B". Buildings on the south side of the valley are used principally for research and testing of explosive devices, while buildings on the north side of the valley are used for material storage and waste disposal. Roughly ten-percent of all the building space at the Mound is located within the test fire area.

The **Lower Area "B"** is used exclusively for infrastructure related purposes and includes facilities such as the sanitary waste treatment plant, wells for drinking water, and warehouse buildings.

The **SM-PP Area** on the sites eastern boundary is relatively independent from the rest of the property. Building uses in the SM-PP area include a mix of production, research and office space. The buildings in the SM-PP area adjacent to Mound Road are presently used for DOE's production of power sources for deep space probes for NASA. Although current planning documents produced by DOE include strategies for shutdown and/or transfer of these facilities by 2005, there is a high probability that the production activities will continue for a much longer period of time. This Plan has not addressed the reuse or redevelopment potential of the northern portion of the 32 acres of land in the SM-PP area.

Undeveloped land at the Mound accounts for approximately forty-six percent of all the land on the site. A majority of the 140 acres of undeveloped land is situated in an area bounded on the south by Benner Road, and the north by an east-west road located at the edge of the SM-PP area, Test Fire area and Lower Area "B". The future development potential of much of the 140 acres is severely constrained by excessive slopes and soils not suitable for development. It is estimated that approximately 60 acres of the 140 is suitable for development.

Buildings with Reuse Potential / Buildings with No Reuse Potential

Based on a review of existing documents which describe the existing condition of buildings on the site, including the Mound Integrated Comprehensive Plan (ICP), the planning team has prepared initial recommendations for buildings to be reused and buildings to be removed. For the most part all buildings identified to be removed by the DOE in the ICP (see figure titled Buildings Scheduled to be Removed by DOE) have been included on the planning team's list of **Buildings with No Reuse Potential**. There are, however, approximately 54,000 gsf of building space scheduled to be removed by the DOE which the planning team considers as having some reuse potential because they are either occupied by MMCIC tenants or potential MMCIC tenants have expressed interest in these facilities. The buildings identified include E, E-Annex, 47, 71, 55, 80, 81, 82, 83 and 84.

The list of buildings considered to have reuse potential (see figure titled Buildings with Reuse Potential) is based on input received from MMCIC and is based upon

their understanding of facilities that would be important in their mission and on a review of existing documents which state the current physical condition of facilities on the mound.

The list of buildings considered to have no reuse potential (see figure titled Buildings with No Reuse Potential) is based in part on the DOE's plans for building demolition stated in the ICP and the planning teams initial assessment of the market for reuse of the facility, the physical condition of the structure and an initial assessment of costs to bring the space up to a marketable standard.

Building and Site Contamination

The Mound is not unlike many industrial sites in that certain land and buildings have accumulated hazardous levels of contamination over the years. While the evaluation of the hazardous waste is outside the scope of this report, the initial analysis did undertake a planing level investigation of contamination on the site as it may impact future development of land, reuse of buildings, and building removal. This information is summarized in the plan titled Areas of Contamination.

Vehicular Circulation

The circulation network at the Mound consists of a series of three, two lane roadways which originate from the plant's main entrance off Mound Road. One road serves the Main Hill via a one way counter clockwise loop around the hill from which there are numerous service drives that access buildings. A second road accesses both Test Fire and Lower Area "B", and connects at the southern edge of the developed portion of the site to form a continuous loop around the site. A third road, the eastern leg of the continuous loop, extends south from the main entrance to the SM-PP area and connects the east-west road that joins with the Test Fire/Lower Area "B" road. In addition there is an unused access road which connects the SM-PP area with Benner Road.

Assessment of Physical Constraints

Topography

The topography of the site has a significant impact on the developability of the site.

Overall, approximately 129 acres (42 percent of the site) has slopes in excess of 10 percent (see figure titled Slope Analysis). Development of these areas would incur a premium expense to construct buildings and parking on the steep slopes. Nearly 95 acres (31 percent of the site) has slopes ranging from 0-5 percent with the remaining 82 acres (27 percent) having slopes ranging from 5-10%.

The northern half of the site (Lower "A", Main Hill, Test Fire, Lower "B" and SM-PP) is generally hilly with high points on the eastern side of the site and sloping down to the western edge of the site. The Main Hill is on a prominent knoll which dominates the sites north-west corner. Numerous areas of flat land are separated by steep slopes and significant changes in elevation. These areas of flat land appear to have been created by the development of the site.

The undeveloped land in the southern portion of the site has a similar topography with high points on the east sloping to the west. Much of the western half of this area along with a small parcel on the southeast corner of the site are flat and can accommodate new development. The portion of the site suitable for development is approximately 60 acres or 43 percent of the southern portion.

Soils

There are roughly ten different types of soils found on the. Of these soil types there are three that are considered suitable for construction of buildings, roads and underground utilities (see figure titled Soils Constraints):

- Corwin
- Miamian
- Urban Land

These three soil types make up approximately 64 acres (21 percent of the total land area).

The seven soil types found on the site considered unsuitable for development. These soils types make up approximately 242 acres (79 percent of the site) and include:

- Fairmount
- Hennepin
- Millsdale
- Milton
- Plattville
- Ritchey
- Ross

These categories of soils are categorized as unsuitable for development because of the proximity of bedrock to the surface, low permeability of the soil and steep slopes. Development in areas containing these soils will incur a premium expense for the development.

Vegetation

The northern half of the Mound, including the Lower "A", Main Hill, Test Fire, Lower "B" and SM-PP have a limited amount of formal or defined landscape improvement (see figure titled Natural Resources). There is a minimum amount landscape improvement associated with the front entrances of buildings OSE, A, and OSW. Most of the interstitial spaces on the site are covered with low maintenance materials such as crushed stone. Other vegetation within the northern half of the site is limited to mature trees on the site perimeter.

In the southern portion of the Mound, the Undeveloped Area, the vegetation generally includes woodland or understory vegetation along the slopes. The flat, lower elevations in the Undeveloped Area are for the most part vegetated with turf. The staging areas are paved with crushed stone or gravel.

No areas of the Mound are vegetated with plant species that are rare or require protection.

Wetlands /Flood plain

Four jurisdictional wetlands exist on the site, all within the north parcel. Surface drainage flows along the lowlands of the site and generally drain from east to west. Flooding from within the site is unlikely as slopes are steep and water is carried away quickly (see figure titled Natural Resources).

An underground aquifer is located beneath land near the southwestern corner of the Undeveloped Area, but also extends into the western edge of the central portion of the northern half of the site. While future development of land over the aquifer is permitted, certain land uses may be excluded from this area, specifically uses such as sewage treatment facilities and underground storage of hazardous materials including petroleum.

The 100 year floodplain of the Great Miami River covers the southwestern edge of the site along the contour of 710. Development of this area is not recommended because of premium costs associated with construction of facilities above the flood level.

Assessment of Development Capacity

Six locations have been identified as potential sites for new development on the Mound:

- Lower Area "A" (including the 870 space Lower Parking Lot)
- The Main Hill Area
- The Test Fire / Lower Area "B" Area
- The SM-P Area
- The South 40

Within each of these areas, the land area within which development could potentially and feasibly be constructed was identified (see figure titled Net Usable Land Area). This is called the Net Usable Land Area. The following table describes the Net Usable Land Area and additional development potential within each of the five locations identified above. The first column identifies each of the five planning districts, the second column identifies the net existing space (in gross square feet) suitable for reuse (see above - Buildings with Reuse Potential), the third column (*Raw Land*) identifies the development potential at a floor area ratio of 0.3 for undeveloped land suitable for development, the fourth column (*Infill*) identifies the development potential at a floor area ratio of 0.3 for land currently occupied by buildings seen as unwanted and candidates for demolition and the fifth column (*Total*) is the sum of columns 3 and 4.

Based upon this analysis, the total potential development capacity of the site is approximately 1.0 million gross square feet.

Planning District	Net Existing Space Suitable for Reuse	Potential Additional Space		
		Raw Land	*Infill*	*Total*
Lower Area "A"	66,100 gsf	137,000 gsf	40,000 gsf	177,000 gsf
Main Hill	600,000 gsf	0 gsf	0 gsf	0 gsf
Test Fire / Lower Area "B"	106,000 gsf	0 gsf	0 gsf	0 gsf
SM-PP Area	80,000 gsf	137,000 gsf	116,400 gsf	253,000 gsf
South "40"	0 gsf	575,000 gsf	0 gsf	575,000 gsf
Total	852,100 gsf	849,000 gsf	156,400 gsf	1,005,000 gsf

Section 2 - Facilities Assessment

Introduction

Facility assessment of several key representative Mound facilities is required to determine the physical condition of individual buildings at the Mound site. Integration of the data from these key facilities with data from previously surveyed facilities permits the projection of probable costs associated with the reuse of the Mound facilities and the development of the Reuse Options for the Mound site.

Scope

Fifty-seven (57) facilities have been identified by the MMCIC as candidates for potential reuse. These facilities are listed in Exhibit 2-1.

As shown in Exhibit 2-1, the MMCIC has requested that fourteen (14) of these facilities be assessed. The facilities are: Buildings A, OSE, OSW, 99, 40, 45, B, 48, M, 89, G, GW, P, and 102.

The DOE has identified eleven (11) Nuclear Energy facilities that will continue to be used by the DOE in their existing capacity for Heat Source support (Page 10 of Mound-ICP). These facilities will not be available for alternate reuse disposition and are as follows: Buildings 30, 36, 37, 39, 44, 46, 50, 88, 101, 102, and EG-2. All of these facilities, except Building 46, are consolidated in the "SM" area. Accordingly, reuse scenarios which are developed in this study exclude the "SM" area. Therefore, Building 102, which is listed above, will not be assessed as part of this study.

Exhibit 2-1 Facilities Selected By MMCIC for Potential Reuse

Bldg. No.	Building Description	Gross Sq. Ft. (K)	Major Contam -ination	MMCIC Request	Phase I ASTM Environ. Assess.	Facility Survey Previously Completed	URS/ Sasaki To Survey	Exist. Leased
3	Manf./Test	12.4	Y	MAYBE		X		X
22	Warehouse	9.1	N	YES				
24	Water Treatment	0.8	N	INFRAST				
27	Manf./Proc.	5.3	Y	MAYBE		X		X
28	Manf.	11.3	N	YES	X	X		X
35	Lab/Test	2.5	Y	YES	X	X		
40	Print/Off.	12.2	N	YES	X		X	
45	Calibration	9.6	N	YES	X		X	
46	Weld Develop	2.4	N	YES	X	X		
48	Mfg.Office	8.0	Y	YES	X		X	
49	Manf.	14.9	Y	YES		X		X
55	Eff.Monitor	0.3	N	INFRAST				
56	Pump House	0.6	N	INFRAST				
57	Sanitary Sewage	0.5	N	INFRAST				
60	Manf.	4.0	N	YES	X	X		
61	Warehouse/ Off.	45.5	N	YES	X	X		
63	Off./Survel.	16.5	N	YES	X	X		X
67	Office	3.8	N	MAYBE				
81	Magazine	0.3	N	YES				X
82	Magazine	0.3	N	YES				X
83	Magazine	0.3	N	YES				X
84	Magazine	0.3	N	YES				X
85	Manf. Fac	3.2	N	MAYBE				
87	Lab./Test	38.8	N	YES	X	X		
89	Storage	4.8	Y	YES	X		X	
94	Lab.	1.2	Y	MAYBE				
95	Chiller	2.0	N	INFRAST				
98	Cent. Fire Station	8.5	N	INFRAST				
99	Office	11.4	N	YES			X	
100	Office	6.3	N	YES	X	X		X
102	Office	11.0	N	YES			X*	
104	Shop	1.8	N	YES	X	X		X
105	Manf./Mach	32.0	Y	YES		X		X
110	Storage	-	N	INFRAST				
112	Sand Filter	0.8	N	INFRAST				

Exhibit 2-1 Facilities Selected By MMCIC for Potential Reuse

Bldg. No.	Building Description	Gross Sq. Ft. (K)	Major Contam -ination	MMCIC Request	Phase I ASTM Environ. Assess.	Facility Survey Previously Completed	URS/ Sasaki To Survey	Exist. Leased
113	Dewater.	0.5	N	INFRAST				
120	Storage	0.1	N	INFRAST				
A	Office	55.6	N	YES			X	
B	Lab./Office	27.7	Y	MAYBE	X		X	
COS	Office /Lab.	64.6	N	YES		X		X
DS	Lab.	47.8	Y	YES	X	X		
E	Laboratory	29.6	Y	MAYBE	X	X		
E-Ann	Office	18.1	N	MAYBE				
G	Garage	7.5	N	YES			X	
GH	Office	5.2	N	YES	X	X		
GW	Office/Stor.	9.8	N	YES			X	
I	Mfg	56.0	Y	MAYBE		X		
M	Manf./Stor.	56.0	Y	MAYBE	X		X	
OSE	Office	90.1	N	YES			X	
OSW	Office	54.3	N	YES			X	
P	Power House	15.1	N	INFRAST			X	
PH	Pump House	0.6	N	INFRAST				
SST	Storage	0.6	N	INFRAST				
W	Shop	32.5	N	YES	X	X		
WH1	Well House	0.4	N	INFRAST				
WHO	Well House	0.4	N	INFRAST				
WH3	Well House	0.1	N	INFRAST				

Methodology

The assessment methodology included seven tasks:

1. Review and analysis of facility reports that previously have been completed. These facilities are listed in Exhibit 2-1.
2. Review of environmental reports.
3. Review of documents that are under the umbrella of the Facilities Management Department of EG&G Mound Technology.
4. Discussions with building and property managers to ascertain factors that may not be included in written reports.
5. Walk-through of selected facilities that previously have been surveyed.
6. Physical walk-through and assessment of the facilities identified in the scope above.
7. As a result of these six tasks, subsequent development of cost requirements for reuse of the facilities under several scenarios.

Facility Survey

Teams with team member expertise were established in four disciplines:

1. Fire Protection, Plumbing, Mechanical and Electrical
2. Structural
3. Environmental
4. Architectural and Building Code Compliance

Physical attributes of the selected facilities were determined and used for cost opinions that are provided in the next section. In order to develop cost indices, the facilities were categorized into three broad building types based on existing use. These are:

1. Office/Administrative
2. Light Manufacturing/Laboratoty
3. General Industry/Storage

Categorization of existing facilities to one of the three types was necessary for cost development but does not restrict the facilities to future use in a similar reuse category. In addition, the physical attributes should be considered to be currently valid. Some physical attributes will degrade for facilities that are placed for an extended time in a "safe shut-down" capacity or that are not adequately maintained until their disposition is determined.

BUILDING 99 OFFICE/ADMINISTRATION

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Although the luminaries are relatively new, generally, they are not modernized. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- Building 99 was constructed in 1989 and, therefore, is not likely to contain ACM or LBP.

Architectural/Building Code Compliance Attributes

- This small footprint, three-story, fireproof constructed building is in good condition, although it will be difficult to use for other than the program for which it was built. Although there is an elevator, it is not completely compliant with ADA requirements, and the building lacks an adequate entrance lobby. The stairs meet current codes.

BUILDING 40 OFFICE/ADMINISTRATION

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Although the luminaries are relatively new, generally, they are not modernized. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- The northern one-third of Building 40 was constructed in 1968, with a three-story annex added in 1986. Due to its age, the annex is not likely to contain ACM or LBP.
- Pipe insulation debris, previously identified above the dropped ceiling in Room 2 as confirmed ACM, was removed in a 1995 abatement project. Floor tile and mastic have been identified as suspected ACM. Built-up roofing materials may contain asbestos. All suspected ACM are currently in good (nonfriable) condition. Exhibit 2-2 summarizes the locations and quantities of ACM in Building 40.

Exhibit 2-2 ACM In Building 40

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Original, one-story portion of building	4,000 square feet
Pipe TSI	Above ground utility piping along outside of building	20 linear feet
Floor title and mastic[1]	Rooms 1,5,6,7 and 9	3,300 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This two-story building is in fair condition. There is no access to the second floor. Penthouse is constructed of unfireproofed steel, which may affect its allowable area. Stair meets code, but fire escape does not meet requirements for new tenancy. Special construction such as vault and raised floor limits flexibility.

BUILDING 45 LIGHT MANUFACTURING/LABORATORY

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility utilizes steam HVAC loads. The system employs a centralized DDC temperature control system. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Most of the luminaries have been replaced, and the system is generally modernized. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. Second floor areas include explosion relief wall panels.

Environmental Attributes

- The single-story concrete block portions of Building 45 were constructed in 1968. Additions to the building were constructed in 1988 and 1995. Due to their age, these additions are not likely to contain ACM or LBP.
- Previously confirmed ACM in the HVAC equipment in the penthouse and some mastic in several rooms were removed in an abatement project in 1995. The original roof was replaced prior to 1983 and may contain asbestos. All confirmed and suspected ACM are currently in good condition. Exhibit 2-3 summarizes the locations and quantities of ACM in Building 45.
- Due to its age, the original portion of Building 45 may be painted with LBP. Paint covers most of the interior walls and ceilings, and is currently in good condition.

Exhibit 2-3 ACM In Building 45

Type of ACM	Location	Estimated Quantity
Built-up roofing materials [1]	Original, one-story portion of building.	2,784 square feet
Pipe TSI	HVAC penthouse and above ground utility piping along outside of building	60 linear feet
Floor title and mastic [1]	Rooms 2 and 3	500 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This radiation calibration laboratory building is in the best condition of any on site. It is generally reinforced masonry (single wythe) bearing wall construction, and has a new built-up roof for the major area, which still exhibits leaks. It is ADA compliant and meets most current code requirements, but does not have any radiation shielding on the roof.

BUILDING 48 LIGHT MANUFACTURING/LABORATORY

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The facility has a temperature control air compressor.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Generally, the luminaries are in poor condition and have not been modernized. The communication raceway is adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- Building 48 was constructed in 1970.
- Confirmed ACM include 2' x 4' ceiling tile in the first floor corridor, and pipe and tank insulation throughout the building. Some TSI has been abated. Assumed ACM includes flooring materials, transite panels and fume hoods in several areas. The laboratory counter tops are suspected ACM. All confirmed and suspected ACM are currently in good condition. The roof was replaced in 1986 and is unlikely to contain asbestos. Exhibit 2-4 summarizes the locations and quantities of ACM in Building 48.
- Due to its age and/or appearance, Building 48 may be painted with LBP. Paint covers most of the interior walls and ceilings of the building and is currently in good condition.

Exhibit 2-4 ACM In Building 48

Type of ACM	Location	Estimated Quantity
Pipe TSI	Throughout building--mostly in Room 102 (Mech. Rm.), above dropped ceilings, and on above ground utility piping along outside of building	120 linear feet
Cementitious TSI on pipe fittings	Throughout building--mostly above dropped ceiling	40 count
2'x4' ceiling tile with holes	First floor corridor	600 square feet
Transite panel[1]	Room 205	20 square feet
Laboratory counter tops[1]	Throughout second floor labs	100 square feet
Floor title and mastic[1]	Throughout building	7,950 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

This two-story, partially in-ground and cast-in-place concrete laboratory has not been modernized or updated to current accessibility standards. As such, the building's uses are restricted to its current program or to uses such as storage. The building has specialty features such as explosion blow-out exterior wall construction and various vaults.

BUILDING 89 GENERAL INDUSTRY/STORAGE

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Luminaries are adequate for storage.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. The exterior staircase and walkway, which is used for emergency egress, was attached to the main building foundation, but it has been separated from the foundation structure. This needs to be repaired to permit building occupancy.

Environmental Attributes

- Building 89 was constructed in 1985 and, therefore, is not likely to contain ACM or LBP.

Architectural/Building Code Compliance Attributes

This is a one-story masonry wall storage building with partial basement for mechanical equipment. It is in good condition, although some moisture has penetrated the walls and caused peeling paint and exterior mortar cracks. The building has few windows or other architectural character, but because of its open interior, it is convertible to higher uses. The building is divided in half by a rated masonry wall (probably satisfying building classification regulations for its unprotected steel roof structure). The extent of ADA upgrades such as toilets and hardware would depend upon the building's future use.

BUILDING A OFFICE/ADMINISTRATION

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Some luminaries have been replaced, but, in general, the system is not modernized. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- Part of Building A was constructed in 1948 with additions in 1959, 1960, 1964, 1966, 1967 and 1968.
- Most of the built-up roofing materials have been replaced since 1983 and likely would not contain asbestos. Confirmed ACM include TSI and condensate tape throughout the building, and firestop material in the basement. All asbestos-containing TSI has been removed from the first floor, basement corridor and stairwells, and crawl spaces. Assumed ACM include flooring materials throughout the building. All confirmed and suspected ACM are currently in good condition. Exhibit 2-5 summarizes the locations and quantities of ACM in Building A.
- Due to its age, Building A may be painted with LBP. Paint covers most of the interior walls and ceiling of the building and currently is in good condition.

Exhibit 2-5 ACM In Building A

Type of ACM	Location	Estimated Quantity
Built-up roofing material[1]	Area 7 (Southwest portion of building)	2,740 square feet
Pipe TSI	Rooms 2,4,10,11,16,18,24,24A, 25, 26,27,31,32,34,202, and on above ground utility piping along outside of building	326 linear feet
Pipe wrap	Rooms 11, 30 and 209	18 linear feet
Cementitious TSI on pipe fittings	Rooms 10 and 202A	21 count
Ceiling tile	Room 2	112 square feet
Floor tile and mastic[1]	Throughout building	39,000 square feet

[1] Due to its age and/or appearance, this material is assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- The Administration Building has the architectural character of an early modern (1950's) institutional office complex having suites with interconnecting doors on either side of a central corridor. The majority of the partitions in this fireproof constructed building are masonry, most in the same position as when originally built in 1948. These partitions significantly limit the building's flexibility. The exterior skin, with the exception of the roof, is in good condition, and new windows have been installed in the existing brick wall openings. Handicapped access is difficult, and all door hardware needs replacement. The three stair towers do not meet current codes for tread, riser or railing dimensions. Placement of exit signs is not consistent due to the interconnected nature of adjacent buildings.

BUILDING B LIGHT MANUFACTURING/LABORATORY

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances. Much of the piping is exposed in the corridors.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is adequate but probably not acceptable for reuse applications.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Generally, the luminaries have not been modernized. Some of the electrical conduit is exposed in the corridors. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. Cellular floor within non-structural topping.

Environmental Attributes

- Building B was constructed in 1948, with additions in 1965 and 1968.
- Portions of the roof have been replaced since 1983 and, therefore, would not be likely to contain asbestos. Confirmed ACM include TSI and pipe wrap, drywall joint compound, and a transite fume hood. Assumed ACM include flooring materials throughout the building. All confirmed and suspected ACM are currently in good condition. Exhibit 2-6 summarizes the locations and quantities of ACM in Building B.
- Due to its age, Building B may be painted with LBP. Paint covers most of the interior walls and ceilings of the building and is currently in good condition.

Exhibit 2-6 ACM In Building B

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Areas 2, 4, 5, and 7 (north and west portions of roof)	8,400 square feet
Pipe TSI	Rooms 101, 103, 105, 105B, 126, HVAC penthouse rooms, crawl spaces, and above ground utility piping along outside of building	1,320 linear feet
Pipe wrap	Rooms 105, 164 and 180	135 linear feet
Cementitious TSI on pipe fittings	Room 130, HVAC penthouse, and crawl spaces	80 count
Tank TSI	HVAC penthouse	200 square feet
Drywall and joint compound	Room 105A	500 square feet
Transite fume hood	Room 170	28 square feet
Floor title and mastic[1]	Throughout building	15,000 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This one-story, masonry, post-war laboratory building has been utilized for 48 years with little or no modernization, and additions or modifications only as needed. There are no accommodations for the handicapped public and much deferred maintenance. Egress ratings are indeterminate, as are integration of the existing fire walls with any code-derived pattern of area determinations. Since this building is part of a larger complex, there is no clear entry and little interior orientation to the outside.

BUILDING G GENERAL INDUSTRY/STORAGE

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Lighting is acceptable for industrial applications. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. Light capacity mezzanine/rack system to be removed. Light industrial jib crane attached to roof system.

Environmental Attributes

- Building G was constructed in 1948.
- The roof was replaced in 1986 and, therefore, is unlikely to contain asbestos. TSI throughout the building has been confirmed to contain asbestos, and flooring materials are assumed to contain asbestos. All confirmed and suspected ACM are currently in good condition. Exhibit 2-7 summarizes the locations and quantities of ACM in Building G.
- Due to its age, Building G may be painted with LBP. Paint covers most of the interior walls and ceilings of the building and is in good condition.

Exhibit 2-7 ACM In Building G

Type of ACM	Location	Estimated Quantity
Pipe TSI	Throughout the building and on above ground utility piping along outside of building	565 linear feet
Cementitious TSI on pipe fittings	Rooms 1 and 2	22 count
Floor title and mastic[1]	Rooms 4, 5, 5A and 7	385 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This is an industrial building used as a storage and maintenance garage. It has masonry walls with single pane glass industrial steel windows, precast concrete plank roof deck on unprotected steel truss structure with high bay industrial lighting, and slab-on-grade concrete floor. Although used for vehicle repair, the building does not meet current standards for ventilation and exhaust of fumes. ADA upgrades are required.

BUILDING GW GENERAL INDUSTRY/STORAGE

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Generally, the luminaries are adequate for industrial use. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- Building GW was constructed in 1968.
- There is no record of roof replacement; therefore, the possibility exists that the built-up roofing materials contain asbestos. Confirmed ACM include pipe TSI and transite, and assumed ACM include flooring material. All confirmed and suspected ACM are currently in good condition. Exhibit 2-8 summarizes the locations and quantities of ACM in Building GW.
- Due to its age, Building GW may be painted with LBP. Paint covers most of the interior walls and ceiling and is currently in good condition.

Exhibit 2-8 ACM In Building GW

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Entire roof	5,000 square feet
Pipe TSI	Above ground utility piping along outside of building	20 linear feet
Pipe wrap	Room 117 and corridor outside of Room 23	40 linear feet
Cementitious TSI on pipe fittings	Rooms 23, 112 and 117	46 count
Transite Table top	Room 114	12 square feet
Floor title and mastic[1]	Rooms 112, 117, and 222, and corridor outside of Room 23	532 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This is a narrow infill building between G and W, and has little architectural merit except to provide these adjacent buildings with more usable space. Handicapped access is difficult and, as the major portion of the steel structure is exposed, egress is not properly rated.

BUILDING M GENERAL INDUSTRY/STORAGE

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. The lighting is adequate for existing industrial use but may need to be upgraded for reuse. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. Five-ton capacity overhead crane is located within a high bay area. Local areas of roof leaks were observed, approximately 700 square feet.

Environmental Attributes

- Building M was constructed in 1948 with additions in 1960, 1961, 1962, 1963, 1969 and 1980.
- Portions of the roof have been replaced since 1983, and it is unlikely that these newer materials contain asbestos. Confirmed ACM include TSI, gasket material, sprayed-on fireproofing, ceiling tile, transite and asbestos board. Flooring materials throughout the building are assumed to contain asbestos. Asbestos fallout has been observed in Room 20 but has been cleaned up. Confirmed and suspected ACM are currently in good condition. Exhibit 2-9 summarizes the locations and quantities of ACM in Building M.
- Due to age, Building M may be painted with LBP. Paint covers most of the interior walls and ceilings and is currently in good condition.

Exhibit 2-9 ACM In Building M

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Areas 1, 2, 4, 5, and 6 (entire roof except eastern portion)	31,000 square feet
Pipe TSI	Throughout interior of building and on above ground utility piping along outside of building	2,020 linear feet
Pipe wrap	Rooms 8, 8C, 19, 20, 108 and 110	130 linear feet
Cementitious TSI on pipe fittings	Rooms 2, 8B, 20, 37A, and 108	78 count
Cementitious duct insulation	Room 250P	400 square feet
Gasket material	Room 20	1 count
Sprayed-on fireproofing	Rooms 103 , 103A, and Stairwell #3	1,160 square feet
Ceiling tile	Rooms 12 and 14	3,500 square feet
Transite	Room 20	5 square feet
Duct work constructed of asbestos board	Room 250P	90 square feet
Floor title and mastic[1]	Throughout building	20,727 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

This is an industrial building with masonry walls, single glazing in industrial steel sash to which tinted film has been added at the high bay windows, and a precast concrete plank roof deck on exposed steel. The floor is concrete slab except for areas of end grain wood block flooring. There are also concrete equipment pads spotted around. The locker room/toilets require ADA upgrades, as do all the doorways and hardware. Fire rating is indeterminate due to existing building additions. There are few if any new finishes or lighting fixtures.

BUILDING OSE OFFICE/ADMINISTRATION

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern and in good condition.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Although the luminaries are relatively new, generally, they are not modernized. Communications and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity. Cellular floor within non-structural topping.

Environmental Attributes

- Building OSE was constructed in 1987 and, therefore, is not likely to contain ACM or LBP.

Architectural/Building Code Compliance Attributes

- This four-story modern office building is in good condition with flexible spaces and can be easily converted to multi-tenant use by adding fire rated tenant separation walls. Most public facilities are ADA compliant, with a few clearance and hardware issues to be addressed. Stairs meet current codes except for tread nosings and open pipe railings. There are insufficient exit signs. Continued use of special spaces, such as the cafeteria, in their current configuration would depend on final tenant mix.

BUILDING OSW OFFICE/ADMINISTRATION

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is modern.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Some of the luminaries have been replaced; but, in general, the system is not modernized. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- Building OSW was constructed in 1975.
- The lower (western) portion of the roof was replaced in 1987 and, therefore, is not likely to contain asbestos. Confirmed ACM include a transite table top in room 141, condense tape in Room 404, and pipe TSI in Rooms 501P and 502P. Assumed ACM include flooring materials throughout the building with the possible exception of the 1st and 2nd floors which have been renovated. The built-up roofing material is considered to be suspected ACM. Exhibit 2-10 summarizes the locations and quantities of ACM in Building OSW.
- Due to its age, Building OSW may be painted with LBP. Paint covers most of the interior walls and ceilings of the building and is currently in good condition.

Exhibit 2-10 ACM In Building OSW

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Upper roof (eastern portion)	4,050 square feet
Pipe TSI	Penthouses 501 P and 502 P, and on above ground utility piping along outside of building	220 linear feet
Pipe wrap	Room 404	10 linear feet
Transite table top	Room 141	15 square feet
Floor tile and mastic[1]	Throughout building, possible exception 1st and 2nd floors	24-48,000 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

- This four-story building is in fair condition, having been partially renovated to an open plan office space. However, the floor plate and core placement dictated by its relationship to adjacent buildings results in office space which is not necessarily flexible nor pleasant. There is legal access to all floors if security restrictions are removed, but the public facilities need improved clearances and new hardware. Stairs do not comply with current codes for tread, riser or railing dimensions.

BUILDING P GENERAL INDUSTRY/STORAGE

Fire Protection, Plumbing, Mechanical and Electrical Attributes

- The facility is fully fire suppressed for ordinary hazard occupancy. The fire hoses have been removed from all standpipe hose cabinets. Fire Department connections are not provided. The fire alarm system ties into the central on-site system in Building 98.
- Electrical hot water heating equipment is included in the facility. Reduced pressure backflow preventers are not provided on domestic water service entrances.
- The facility has HVAC steam loads. The HVAC systems employ a DDC temperature control system with the head-end in Building W. The overall HVAC system is adequate for existing applications.
- The facility has an adequately sized electrical service entrance in good condition. Lighting loads are fed at 115-V. Lighting is adequate for existing applications but probably needs to be upgraded for reuse applications. Communication and data raceways are adequate.

Structural Attributes

- The building is structurally sound and will support continued use or reuse in a similar capacity.

Environmental Attributes

- The Powerhouse was constructed in 1948 with additions in 1971 and 1982.
- Asbestos-containing flashing is used on the roof, but the asbestos content of the remaining built-up roofing materials is unknown. Confirmed ACM include TSI, and assumed ACM include flooring materials. Some asbestos-containing pipe TSI was removed after an asbestos survey. All confirmed and suspected ACM are currently in good condition. Exhibit 2-11 summarizes the locations and quantities of ACM in Building P.
- Due to its age, Building P may be painted with LBP. Paint covers most of the interior walls and ceilings. High temperatures and humidity have caused much of the paint on the ceiling to peel and flake. Approximately 3,200 square feet of paint is damaged.

Exhibit 2-11 ACM In Building P

Type of ACM	Location	Estimated Quantity
Built-up roofing materials[1]	Entire roof	15,143 square feet
Pipe TSI	Throughout building and on above ground utility piping along outside of building	2,230 linear feet
Cementitious TSI on pipe fittings	Throughout building	71 count
Tank TSI	Mezzanine level	610 square feet
Floor title and mastic[1]	Office area	450 square feet

[1] Due to its age and/or appearance, this material was assumed to contain asbestos.

Architectural/Building Code Compliance Attributes

The power plant is a masonry and exposed steel structure built to enclose the central steam boiler plant. It is well maintained and cannot easily be used for any other purpose. Its future is linked with that of the current site utility delivery system.

Building Condition Description

The following is a narrative description of buildings on the Mound. Information within this section has been brought together from various sources information including previous reports prepared for both the DOE and MMCIC (identified below - Pertinent References), and conversations with facilities management personnel on the site. Although field investigations were limited to the fourteen buildings identified above, information below may include informal field observations made by the reconnaissance team.

Building 1 - Small building in poor condition. Supposedly not contaminated with energetic or radioactive material. Does contain asbestos. No significant reuse potential.

Building 2 - Antiquated building in poor condition. Contaminated with energetic material and asbestos. No significant reuse potential.

Building 3 - Structurally sound building. Mechanically fair condition. Architectural-Code Retrofit cost will be relatively low since it is a single-story, low-occupancy building. Can be used for energetic materials. When its present testing capabilities are no longer needed, dismantling of the equipment and cost for remodeling for other applications will probably exceed facility value.

Building 4 - Small building used a security post. No significant reuse potential.

Building (Magazines) 5, 6, 7, 8, 10, 11, 20, 52, 53, 54, & 64 - These magazines are in relatively poor condition. Several other magazines in better condition are being reused. Only other viable application is energetic materials storage.

Building 13 - Firing shed. No reuse potential.

Building 19 - In relatively good condition. Singular use for warehousing. Not contaminated with energetic or radioactive material. Good candidate for consideration if additional small warehouses needed. May be categorized for reuse.

Building 21 - Thorium sludge facility, and highly contaminated.

Building 22 - Good overall condition. Structurally sound storage building (heat only), fully sprinklered, loading docks, and minimal offices to support warehousing. Not contaminated, but potential concern that it could become contaminated before turned over by DOE.

Building 23 - Contaminated radioactive storage building.

Building 24 - Building structurally sound. Not contaminated. Houses large water tanks. Cost to dismantle tanks and remodel for other applications would probably exceed value of building.

Building 25 - In poor condition. Contaminated with asbestos. Used as weather station. No reuse potential.

Building 27 - In poor condition. It may be contaminated with energetic material. No reuse potential.

Building 28 - Structurally sound. Good mechanical system. Recently modified by MMCIC for machine shop application. Relatively minimal cost to retrofit to full code compliance. Could be used for other industrial applications with minimal expenditure.

Building 29 - In good condition, but process equipment contaminated with asbestos. Cost to remove equipment and modify building for reuse is prohibitive.

Building 30 -Small building that is used primarily for storage, and is slightly contaminated. After the heat source missions are completed it will have no reuse possibilities.

Building 31 - In fair condition. Prefab metal building used for storage of TRU waste. Not now contaminated but will probably exceed useful life when site closure activities are completed.

Building 33 - In poor condition. Old maintenance shop in the SM area. No reuse potential.

Building 34 - In poor condition. Used for training. Contaminated with depleted uranium. No reuse potential.

Building 35 - In good condition. Used for x-ray and eddy current nondestructive testing. Small building that could be used for various industrial applications with minimal modification cost. Connected to and served as control room for neutron radiography facility (Bldg. 59) which hasn't been used for several years. Until the source is removed and Bldg. 59 successfully dismantled, there will be a continuing concern with potential radiation and/or contamination of Building 35.

Building 36 - In good condition. No unique capabilities--primarily an open building containing testing equipment and ovens. Not contaminated but does contain asbestos. Following the heat source mission it could be used for various industrial applications. Due to it small size and as a result of it lack of specific capabilities, it will be difficult to find an economically viable reuse for this building.

Building 37 - In good, uncontaminated condition. Almost analogous to building 36 except configured more to laboratory operations. Following heat source mission it could be used for various industrial technology missions. Due to its small size and as a result of its lack of specific capabilities it will be difficult to find an economically viable reuse of it.

Building 38 - PP-building, structurally is in good condition. Has some residual radiological contamination. Decision has been made to demolish.

Building 39 - In fair condition. Used as a satellite mechanical for the SM/PP area. When the heat source missions are completed, it will have no reuse potential.

Building 40 - In good condition. Houses print shop in first floor and offices on second floor. Currently has excellent printing capabilities. Accessibility to second floor is limited and intermediate cost level will be required for retrofit for code compliance. First floor well-configured for print shop and could be modified for other industrial applications. Accessibility to second floor will limit utilization.

Building 42 - In poor condition. Contaminated with energetic and asbestos. No reuse potential.

Building 43 - In poor condition. Contaminated with energetic and asbestos. No reuse potential.

Building 44 - In fair condition. Used a satellite cafeteria for the SM/PP area. When the heat source missions are completed, it will have no reuse potential.

Building 45 - Recently expanded and old sections remodeled. Used for calibration of radiation instrumentation and for dosimetry. Has excellent existing capabilities, and is probably best building on site. Because of special configuration, it may be difficult to use in application other than for which it is designed. Cost to dismantle existing capabilities and refit building for applications which could not use unique configuration would probably exceed value of building.

Building 46 - Presently listed to be maintained by DOE for the GPHS program. More probable that welders and weld development capabilties will be relocated to the SM/PP area (such as building 36). Building is small, but can easily be retrofitted to other industrial applications.

Building 47 - In good, uncontaminated condition. Used as administrative facility for security force. Decision has been made to demolish the building. Disposition related to building W decision.

Building 48 - In fair condition. Used to analyze energetic materials, but presently doesn't have any viable capabilities. Has some residual energetic contamination and major accessibility problems. Cost to retrofit for code compliance will be relatively high. Moderate amounts of expenditure will be required to remodel the building for industrial applications.

Building 49 - In fair condition. It has been leased for energetic application. Moderate expenditures will be required to retrofit for code compliance. If existing applications terminate, doubtful reuse for alternative application at moderate cost. Accordingly, its value for other applications is marginal.

Building 50 - In very good condition. When the GPHS equipment is moved from building PP to building 50 it will become a valuable and expensive building with

some unique capabilities. However, it is doubtful that the unique capabilities can be utilized in reuse endeavors. If the facility cannot be fully utilized in applications that take full advantage of its capabilities, the cost to operate will be very high and the cost to remove cells and other equipment and remodel it for some other technology or industrial application will be prohibitive.

Building 51 - In fair condition. Used for thermite work. Contaminated with energetic materials. No reuse potential.

Building 55 - In poor condition. Very small building used for storage. No reuse potential.

Building 56 - In good condition. Houses the fire water pumps. Due to its size this is its only use. If that need would terminate, the building would need to be demolished.

Building 57 - In good condition. Serves as Sanitary Sewer Treatment. It will function for many years in this capacity. Has no other capabilities and would need to be demolished if the need is terminated.

Building 58 - Filter building for SW building. Contaminated with radiological contaminants. No reuse potential.

Building 59 - In poor condition. Neutron Radiography facility contaminated with radiological contaminants. No reuse potential.

Building 60 - In good condition. Two-story building with major accessibility problems . Retrofit for code compliance will be relatively high,. Presently does not have any viable capabilities. If it could be consolidated with Building 28, the retrofit cost may be minimized. It can be remodeled and used for various industrial applications. However, code compliance retrofit and remodeling cost may exceed the value of the building.

Building 61 - In very good condition. Used primarily as a procurement and distribution center and accommodates both offices and warehousing. Has convenient accessibility to excellent public docking capabilities, etc. Minimal code compliance expenditures will be required. As a result of its open space in the warehouse section and predominant open plan office systems in the office areas the building could be readily used for various industrial applications.

Building 63 W - In good condition. Small, single storage building that houses large environmental chambers. Doubtful that capabilities will be needed in the future. A few chambers may be moved to Building 3. If chambers are dismantled and removed, the building would be useful for various industrial application. However, if the building is taken over with the chambers intact, the cost to dismantle them and remodel the building for other applications will probably exceed the value of the building.

Building 63E - Two-story building in good condition. The second floor has primarily offices and the first floor open space is ideal for industrial application. Has major accessibility problems compounded by offices on the second floor. Relative cost to meet code requirements will be high. Building value exceeds the projected cost for retrofit, and is ideally suited for various industrial applications ranging from testing to light manufacturing.

Building 67 - Concrete-covered polystyrene foam. Office support building which is reported to be uncontaminated. Minor cost required for code compliance. Location in lower area limits it for office support for any operations other than for energetic materials. Since there are other more desirable offices in test fire area, this building has very limited reuse potential.

Building 68 - In good condition. Small metal building being used for storage by D&D. After demolition of SW & R Buildings, useful life of building 68 will have exceeded. No reuse potential.

Building 71 - In good condition. Designed and used for flammable liquid storage. Good reuse potential to be used in the same capacity. Removal should be reevaluated.

Building 73 - In good condition. Designed and used for cylinder storage. It has good reuse potential to be used in the same capacity. Removal should be reevaluated.

Building 74 - In poor condition. Small storage/repacking facility for energetic materials.

Building 79 - Small modular office building in poor condition. No reuse potential.

Building (Magazines) 80, 81, 82, 83, 84 - These magazines are in good condition. When the are no longer needed they will need to be disposed of since they have no other viable applications other than storing energetic materials.

Building 85 - In excellent, uncontaminated condition and never used. New R & D building with ultra-modern remote operations capabilities.

Building 87 - In very good condition. Ultra-modern building with three very large test cells. Cost to retrofit for code compliance will be relatively minor. If electronic components associated with test cells are removed, design capabilities will be questionable. Much of the physical space is associated with the test chambers; net usable space for applications other than the test cells applications is very unfavorable. If the unique capabilities cannot be used, cost to operate in present physical state will be very high and cost to remove the cells and remodel to other application will be prohibitive.

Building 88 - In fair condition. Wooden modular building which will exceed usefulness when heat source business has terminated. No reuse potential.

Building 89 - In good condition. Exterior staircase and walkway (used for emergency egress) must be repaired. Other cost associated with code compliance will be minor. Primary reuse potential will be as a warehousing/storage facility. Could also be remodeled for other industrial applications at relatively low cost.

Building 90 - In poor condition. Small radiologically contaminated storage building. No reuse potential. Building has already been removed.

Building 91 - In poor condition. Modular office building with no reuse potential.

Building 92 - Small modular office building. It has been removed from site. No reuse potential. Building has already been removed.

Building 93 - In fair condition. Modular office building in fair condition with no reuse potential.

Building 94 - In good condition. Minor cost required for code compliance. Ovens in the building can be removed at moderate cost. Building can be used in various industrial applications. However, small size and location limits potential for reuse.

Building 95 - SM/PP chiller plant. Although not identified by the DOE for its continuing mission, it should be. It may be reused to service other buildings such as Bldg. 105 after the heat source program is concluded.

Building 96 - Small vehicle storage building. It has been removed for site. No reuse potential. Building has already been removed.

Building 98 - In very good condition. Two-story Central Fire Station with accessibility problems. Cost for code compliance moderate. Has unique capabilities such as vehicle storage and dormitory housing accommodations which limit reuse to similar applications.

Building 99 - In very good condition. Three-story building with open industrial areas on first floor, offices on the second, and emergency communication center on third. In very good condition. Minor cost will be required for code compliance retrofit. Large stair well and elevator shafts reduce net rentable to gross ratio. Retrofit to office or conference facility would require significant expenditure.

Building 100 - In good condition. Experienced little usage. Relatively minor costs required for code compliance retrofit. Has both men's and women's shower rooms. Could be used for various industrial or office application. Much of its internal space can be considered as unfinished space. Configuration including multiple-level flooring will require moderate expenditures for reuse.

Building 101 - In good condition. Wooden modular building used for storage and offices. Will outlive usefulness when heat source business has terminated. It has no reuse potential

Building 102 - In excellent condition. It is a two-story building. Its configuration does not lend itself to modern office arrangement and thus does not have optimum usable to gross ratios. However, if maintained adequately it should be reused in office when the heat source business is concluded.

Building 104 - In good condition. Relatively minor costs will be required for code compliance. Very good potential for industrial application with minor cost for remodeling. Recent past applications as a satellite mechanical shop could be reestablished. Small size limits its applications.

Building 105 - In very good condition. State-of-the-art industrial machining complex. Very minor costs required for code compliance. Designed with mezzanine area that can be finished for administrative space. Will continue as a machine shop but could be modified to light manufacturing or related industrial applications.

Building 110 - Consists of concrete dike area for the containment of two large fuel storage tanks. No cost should be associated with its continued use in this capacity. No other reuse potential.

Building 112 - Associated with the sanitary disposal complex. In good condition. No other reuse potential.

Building 113 - Associated with the sanitary disposal complex. In good condition. No other reuse potential.

Building 114 - Has less than 100 square feet. No reuse potential. Building has already been removed.

Building 120 - Less than 100 square feet. No reuse potential.

Building A - The original administration building. A two-story building with a basement. Structurally in good condition. Will require relatively high costs for code compliance retrofit. Relatively long and narrow configuration, coupled to masonry partitioning, limits its flexibility and ability to be reconfigured to a modern office complex. The building additions further complicate reconfiguration. Reopening the main front entrance to A-building would be highly desirable.

Building B - In fair condition. Major cost will be required for code compliance. Building has many relatively small rooms with some blow-out panels. Has old clean room and new clean room complex. New clean room complex has never been used. Functionally questionable. Reuse potential for industrial or technology applications With exception of new clean room complex, internals of building will need to be removed and building remodeled for new reuse applications. In addition the docks, roadway access, etc., will need to be improved. Cost to remodel and comply with code may exceed value of building.

Building C - In good condition. Originally the cafeteria and more recently used for bonded storage. HVAC needs to be remodeled with accompanying cost estimate prohibitive. If a decentralized HVAC plant is decided, decision for removal of this building should be revisited.

Building COS - In very good condition. Moderate cost required to retrofit for code compliance depending on conversion to multi-tenant use. Building is four-stories with basement. Basement is high level clean space. Designed with high degree of flexibility for use as laboratory or office space. Flexibility was provided with a "cost" of unfavorable net to gross ratio. Accordingly, complex should be oriented as much as possible to research/laboratory applications which command a much higher rent value than do offices. Building can be reused in technology or industrial applications.

Building DS - In good condition. Single-story building. Moderate to high cost required for code compliance retrofit. Eastern third of building houses the Metrology Center and high-level clean room. If equipment remains in place area can continue reuse as is. Internals of western two-thirds of DS building need to be removed and reconfigured for future reuse applications. If E building is removed from site, analytical capabilities should be relocated to western portion of DS building. In addition to analytical applications, the DS building can be used for various technology or industrial applications.

Building E & E Annex E - In good condition. Received EPA approval for reuse. Supposedly not contaminated with the exception of some asbestos. Apparently, DOE is concerned about contamination resulting from D & D of R & SW buildings. Buildings have definite reuse potential in existing capacity. Feasibility of relocation of the capabilities from E-building to some other location, such as DS-west side should be considered before a final decision to remove E-building. If the decision to keep appears feasible, the possibility of keeping the R & E additions, all space to the East of column line G on the R-building drawing, should be examined. These additions would enhance E-buildings functionality and greatly reduce the cost of the demolition of R & SW buildings.
Building EG 1,4,5,6,& 7 - Emergency generators. They have no reuse potential.

Building EG-2 - Emergency generator. No reuse potential after heat source program is concluded.

Building G - In fair condition. Used as a garage. Has no other economical reuse, and needs both maintenance work on windows as well as updated exhaust systems and plumbing/drains.

Building GH - In good condition. Single-story office complex. On relative basis, retrofit cost for code compliance will be moderate. Location makes it an excellent building for office reuse. Small size limits potential. Open plan office system needs to remain in place in order to minimize cost for reuse.

Building GIS - In fair condition. Small guard shack.

Building GP-1 - In good condition. Original guard post used for security training and includes firing range, physical fitness, etc. Configuration does not lend itself to remodeling as an office building or other industrial applications.

Building GP-44 - Small guard shack. No reuse potential.

Building GW - Two-story office building located between G and W building. Has an elevator in the back portion of the building. Second floor not easily accessible. Front half of both floors used for office. Front areas will need to be remodeled. Cost for code compliance and remodeling will be relatively high. Reuse of GW will be dependent on reuse of W building, with building G being structurally dependent on the two. Verification of abandoned underground fuel tank is needed.

Building H - In poor condition. Used for various applications ranging from laundry, credit union, bioassay laboratory, etc. Some radiological contaminants. Cost to remodel for viable industrial application would probably exceed value of the building. No reuse potential.

Building HH - In poor contaminated condition. No reuse potential.

Building I - In fair condition. Major cost will be required for code compliance. Building has many relatively small rooms with some blow-out panels. Has old clean room and new clean room complex. New clean room complex has never been used. Functionally questionable. Reuse potential for industrial or technology applications With exception of new clean room complex, internals of building will need to be removed and building remodeled for new reuse applications. In addition the docks, roadway access, etc., will need to be improved. Cost to remodel and comply with code may exceed value of building.

Building M - In poor condition and needs extensive work on exterior walls, windows, and clerestory. HVAC will require improvement if used as a fully air-conditioned building. On relative basis, cost for cost compliance will be minimal since it is not an office building. Toilets and doors are a concern depending on reuse. Has both high bay and low bay areas, and a new plating facility which as never been used. Plating areas are contaminated with heavy metals, arsenic, cyanide, and machining areas with oils and cutting fluids. With the possible exception of plating, Building M does not have any capabilities other than interim storage. Lack of dock minimizes reuse application potential. Has a number of potential industrial applications including light manufacturing. Since it is primarily open space, the existing wall and partition would probably be removed and the space remodeled.

Building OSE - In excellent condition. Four-story building with cafeteria on first floor, auditorium on second, and computer center on fourth. Minor costs required for retrofit for code compliance. If wall systems and open plan office system remain in place, building can be reused as office/conference center with minimum cost.

Building OSW - In good condition. Four-story building. Moderate cost required for retrofit for code compliance. First, second, and two-thirds of third have been remodeled over the last several years. Remaining portion of the third and four floors need to be remodeled in order to replace existing masonry partitions with more flexible systems. Wall systems and open plan office system in remodeled space need to remain in order for building to be economically viable.

Building P - Central power house. If the decision is made to go to decentralized HVAC plants there will be no need for P-building and it should be removed. If decision is made to continue with a Centralized Power Plant, then P-building must not be removed.

Building PH - In fair condition. A small storage building. No reuse potential.

Building PS - In good condition. Paint shop. Contaminated with asbestos, organic compounds, and other materials associated with a painting operations. Has no reuse potential other than as a paint shop.

Buildings R & SW (interconnected) - In good condition. Contaminated with radiological materials. They have no reuse potential (see the discussion related to E-building above).

Building SD - Contaminated and undergoing D&D. No reuse potential.

Building SST - In fair condition. Salt storage building which is not contaminated. No reuse potential.

Building T - In very good condition. Has some residual radiological contamination. Current direction is to complete operations, to partially D&D, and allow residual radioactive material to decay in place. Accordingly, the buildings will not actually be removed.

Building W - In good condition. Originally it is a material handling and warehousing facility and is not contaminated with energetic or radioactive contaminates. More recently it has been the main mechanical shop area. The decision for final disposition of W-building will probably be driven by site not facility considerations. The disposition of W-Building, WG-Building, G-Building and possibly building 47 should be examined as one entity.

Building WD - In poor condition. Contaminated with radioactive contaminants. No reuse potential.

Well Houses 1,2,3 - In good condition. No other reuse potential.

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Building Database

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
1	Test Fire	C	Expl Prod Supp	1	Lab / R&D / Lt. Ind	Poor	38	Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam	Remove	Remove
2	Test Fire	C	Explosives Testing	6.3	Lab / R&D / Lt. Ind	Fair	43	Masonry Ext Walls	BUM Roof Carboline	Central Steam, Chilled Water	Remove	Keep
3	Test Fire	C	Explosives Testing	12.4	Lab / R&D / Lt. Ind	Fair	30	Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam, Chilled Water	Maybe	Keep
4	SM-PP	D	Dosimetry	0.67	Storage / Support / Service						Remove	Keep
5	Test Fire	D	Magazine	0.3	Storage / Support / Service	Fair	47	Reinforced Concrete	Concrete		Remove	Remove
6	Main Hill	C	Magazine	0.09	Storage / Support / Service	Adequate	47	Reinforced Concrete	Concrete		Remove	Remove
7	Main Hill	M	Magazine	0.4	Storage / Support / Service	Fair	39	Reinforced Concrete	Concrete		Remove	Remove
8	Test Fire	R	Magazine	0.07	Storage / Support / Service			Reinforced Concrete	Concrete		Remove	Remove
10	Test Fire	C	Magazine	0.07	Storage / Support / Service	Adequate	9	Reinforced Concrete	Concrete		Remove	Remove
11	Main Hill	C	Magazine	0.4	Storage / Support / Service	Fair	39	Reinforced Concrete	Concrete		Remove	Remove
13	SM-PP	E	Firing Shed	0.05	Storage / Support / Service						Remove	Remove
19	Lower Area "B"	K	Salvage and Sales	4.5	Lab / R&D / Lt. Ind	Good	32	Quonset Hut	Metal	Propane Forced Air, Wind AC	Remove	Keep
20	Test Fire	C	Magazine	0.3	Storage / Support / Service	Poor	32	Reinforced Concrete	Concrete		Remove	Remove
21	SM-PP	E	Raw Material Storage	4.1	Storage / Support / Service	Poor	29	Reinforced Concrete	Metal		Remove	Remove
22	Lower Area "A"	C	Warehouse	9.1	Storage / Support / Service	Good	30	Steel Frame	Metal		Keep	Keep
23	Main Hill	M	Waste Material Staging	3.4	Storage / Support / Service	Fair	29	Reinforced Concrete	BUM Roof Asphalt		Remove	Keep
24	Lower Area "B"	C	Potable Water Treatment	0.8	Storage / Support / Service	Good	29	Masonry Ext Walls	BUM Roof Asphalt	Central Steam	Infrastructure	Keep
25	Main Hill	O	Weather Station	0.4	Storage / Support / Service	Poor	29	Reinforced Concrete	BUM Roof Asphalt	Central Steam, Wind AC	Remove	Remove
27	Test Fire	C	Adv Dev Programs	5.3	Lab / R&D / Lt. Ind	Poor	27	Masonry Ext Walls	BUM Roof Asphalt		Maybe	Keep
28	Main Hill	O	Ceramic Production	11.3	Lab / R&D / Lt. Ind	Fair	29	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
29	Lower Area "A"	F	Adv Dev Plastics	6.6	Lab / R&D / Lt. Ind	Poor	31	Masonry Ext Walls	BUM Roof Coaltar Metal	Central Steam, Chilled Water	Keep	Keep
30	SM-PP	F	Adv Dev & Health Phys	0.7	Lab / R&D / Lt. Ind	Fair	31	Concrete Block	BUM Roof Coaltar		Remove	N/A
31	SM-PP	F	Contaminated Waste	8.7	Storage / Support / Service	Fair	29	Prefab/Metal/ Modular	Metal		Remove	Remove
33	SM-PP	F	SM Area Maintenance	1.3	Storage / Support / Service	Fair	30	Masonry Ext Walls	BUM Roof Asphalt		Remove	Remove

Building Database

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
34	Lower Area "B"	J	Fire Training	1.1	Office / Administration	Poor	30	Masonry Ext Walls	Concrete, Metal		Remove	Remove
35	Test Fire	C	Neutron Radiography	2.5	Lab / R&D / Lt. Ind	Fair	29	Masonry Ext Walls	BUM Roof Asphalt Metal		Keep	Keep
36	SM-PP	F	RTG Support	4.3	Lab / R&D / Lt. Ind	Fair	27	Concrete Block	BUM Roof Asphalt	Central Steam, Chilled Water	Remove	N/A
37	SM-PP	F	Adhesive Formulation	2.5	Lab / R&D / Lt. Ind	Fair	27	Masonry Ext Walls	BUM Roof Asphalt	Central Steam	Remove	N/A
38	SM-PP	F	Nuc Opns Prog & D&D	44.3	Lab / R&D / Lt. Ind	Poor	25	Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water	Remove	Remove
39	SM-PP	F	Nuclear Opns Support	3.5	Storage / Support / Service	Fair	28	Prefab\Metal	Metal	Central Steam	Remove	N/A
40	Main Hill	P	Printing Shop	12.2	Office / Administration	Good	27	Masonry Ext Walls	BUM Roof Asphalt Metal	Central Steam, Chilled Water	Keep	Keep
42	Test Fire	C	High Expl Production	2.9	Lab / R&D / Lt. Ind	Poor	26	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Remove	Keep
43	Test Fire	C	Thermite Development	1.5	Lab / R&D / Lt. Ind	Fair	25	Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water	Remove	Keep
44	SM-PP	F	Cafeteria	2.5	Office / Administration	Fair	26	Masonry Ext Walls	BUM Roof Coaltar	Central Steam	Remove	N/A
45	Main Hill	L	Health Physics	9.58	Lab / R&D / Lt. Ind	Good	24	Concrete Block	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
46	Main Hill	L	Welding Dev.	2.4	Lab / R&D / Lt. Ind	Fair	25	Concrete Block	BUM Roof Asphalt	Central Steam, Chilled Water	Keep	N/A
47	Main Hill	O	Security	3.6	Office / Administration	Excellent	26	Masonry Ext Walls	BUM Roof, Asphalt	Central Steam, Chilled Water	Remove	Remove
48	Main Hill	Q	Surveillance	8	Lab / R&D / Lt. Ind	Fair	24	Reinforced Concrete	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
49	Test Fire	C	Timer Fabrication	14.9	Lab / R&D / Lt. Ind	Fair	25	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
50	SM-PP	F	RGT Assembly & Test	14.8	Lab / R&D / Lt. Ind	Adequate	24	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Remove	N/A
51	Lower Area "A"	F	Development	3.5	Lab / R&D / Lt. Ind	Fair	22	Steel Frame	Metal	Central Steam, Chilled Water	Remove	Keep
52	Test Fire	C	Magazine	0.08	Storage / Support / Service	Adequate	23	Reinforced Concrete	Concrete		Remove	Remove
53	SM-PP	E	Magazine	0.2	Storage / Support / Service	Adequate	9	Reinforced Concrete	Concrete		Remove	Remove
54	Test Fire	Q	Magazine	0.3	Storage / Support / Service	Adequate	9	Reinforced Concrete	Concrete		Remove	Remove
55	Lower Area "B"	K	Waste Mgmt	0.3	Storage / Support / Service	Adequate	21	Masonry Ext Walls	BUM Roof Coaltar		Infrastructure	Remove
56	Main Hill	M	Fire Pump	0.6	Storage / Support / Service	Good	22	Masonry Ext Walls	BUM Roof Asphalt	Central Steam	Infrastructure	Keep
57	Lower Area "B"	C	Sanitary Sewer Treatment	0.5	Storage / Support / Service	Good	20	Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC	Infrastructure	Keep
58	Main Hill	R	Filter Bank	6.6	Lab / R&D / Lt. Ind	Good	17	Steel Frame	BUM Roof Asphalt	Central Steam, Chilled Water	Remove	Remove

Building Database

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
59	Test Fire	C	Neutron Radiography	0.7	Lab / R&D / Lt. Ind	Poor	26	Reinforced Concrete	Rolled Roof		Remove	Remove
60	Main Hill	O	Ceramic Production	4	Lab / R&D / Lt. Ind	Fair	15	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
61	Lower Area "A"	G	Warehouse	45.5	Lab / R&D / Lt. Ind	Good	15	Reinforced Concrete	Metal .06 EPDM	Central Steam, Chilled Water	Keep	Keep
64	Test Fire	C	Magazine	0.07	Storage / Support / Service	Excellent	22	Reinforced Concrete	Concrete		Remove	Remove
67	Test Fire	C	Energetic Material Supp	3.8	Lab / R&D / Lt. Ind	Fair	13	Reinforced Concrete	Metal		Maybe	Keep
68	Main Hill	P	D&D Staging Area	2	Storage / Support / Service	Good	16	Metal	BUM Roof Asphalt		Remove	Remove
71	Lower Area "A"	G	Flammable Liquid Storage	0.8	Storage / Support / Service	Good	12	Steel Framed\Prefab	Metal		Remove	Remove
72	Lower Area "B"	K	Hazardous Waste Storage	2.4	Storage / Support / Service	Good	12	Steel Frame	Metal		Remove	Keep
73	Lower Area "A"	G	Gas Cylinder Storage	2.2	Storage / Support / Service	Good	12	Steel Frame\Prefab	Metal		Remove	Keep
74	Test Fire	C	Storage	0.4	Storage / Support / Service	Fair	12	Steel Frame	Metal		Remove	Remove
79	Main Hill	M	Waste Mgmt Supp	1.7	Office / Administration	Fair	12	Wood/Modular	Hypalon		Remove	Remove
80	Test Fire	C	Magazine	0.3	Storage / Support / Service	Excellent	9	Reinforced Concrete	Concrete		Remove	Remove
81	Test Fire	C	Magazine	0.3	Storage / Support / Service	Excellent	9	Reinforced Concrete	Concrete		Keep	Remove
82	Test Fire	C	Magazine	0.3	Storage / Support / Service	Excellent	9	Reinforced Concrete	Concrete		Keep	Remove
83	Test Fire	C	Magazine	0.3	Storage / Support / Service	Excellent	9	Reinforced Concrete	Concrete		Keep	Remove
84	Test Fire	C	Magazine	0.3	Storage / Support / Service	Excellent	9	Reinforced Concrete	Concrete		Keep	Remove
85	Test Fire	C	Power Blend/Process	3.2	Lab / R&D / Lt. Ind	Excellent	7	Reinforced Concrete	Concrete		Maybe	Keep
87	Test Fire	C	Explosives Testing	38.9	Lab / R&D / Lt. Ind	Excellent	8	Reinforced Concrete	BUM Roof Metal Coaltar	Central Steam, Chilled Water	Keep	Keep
88	SM-PP	F	RTG Admin Supp	7.2	Office / Administration	Good	12	Prefab/Modular	Hypalon	Elec Heat Package AC	Remove	N/A
89	Main Hill	M	Detonator Storage	4.8	Lab / R&D / Lt. Ind	Good	10	Reinforced Concrete	BUM Roof Asphalt	Central Steam Package AC	Keep	Keep
90	SM-PP	E	Retort (Explosive Waste)	0.7	Storage / Support / Service	Good	12	Steel Frame	Metal		Remove	Keep
91	Main Hill	N	Admin/Training	8.1	Office / Administration	Fair	11	Modular	Hypalon	Package Heat & AC	Remove	Remove
92	Main Hill	R	Prod Training	1.6	Office / Administration	Poor	11	Prefab/Modular	Hypalon	Package Heat & AC	Remove	Remove
93	Main Hill	Q	Standards Supp	2.9	Office / Administration	Adequate	11	Modular	Hypalon	Package Heat & AC	Remove	Remove

Building Database

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
94	Lower Area "B"	C	Materials Compatibility	1.2	Lab / R&D / Lt. Ind	Excellent	10	Prefab\Metal	Metal		Maybe	Keep
95	SM-PP	F	Utilities Operations-SM	2	Storage / Support / Service	Good	10	Prefab\Metal	Metal		Infrastructure	Keep
96	Main Hill	O	Armored Vehicle Shelter	0.4	Storage / Support / Service	Poor	11	Armco\Steel Sheet	Metal		Remove	Remove
98	Lower Area "A"	F	Central Fire Station	8.5	Storage / Support / Service	Good	9	Masonry Ext Walls	Metal	Central Steam, Chilled Water	Infrastructure	Keep
99	Main Hill	P	Security Ops	11.4	Office / Administration	Excellent	8	Reinforced Concrete	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
100	SM-PP	D	Security Precinct	6.3	Office / Administration	Excellent	7	Reinforced Concrete	BUM Roof		Keep	Keep
101	SM-PP	F	Engrg Supp	1.8	Office / Administration	Excellent	9	Wood Frame	Hypalon	Package Heat & AC	Remove	N/A
102	SM-PP	F	R.T.G. Program	11	Office / Administration	Excellent	8	Precast Concrete	Metal	Hot Water, Chilled Water	Keep	N/A
104	Test Fire	M	Test Fire Maintenance	1.8	Storage / Support / Service	Excellent	5	Steel Framed	Metal	Central Steam, Chilled Water, Elec Heat	Keep	Keep
105	SM-PP	D	Parts Machining	31.9	Lab / R&D / Lt. Ind	Excellent	8	Steel Framed\ Cast Con	Metal	Hot Water, Chilled Water	Keep	Keep
110	Lower Area "B"	F	Fuel Storage Tanks	0	Storage / Support / Service						Infrastructure	Keep
112	Lower Area "B"	C	Sanitary Disposal Sand Filter	0.8	Storage / Support / Service	Excellent	11	Steel Frame	Metal	Elec Heat	Infrastructure	Keep
113	Lower Area "B"	C	Sanitary Disposal Dewatering	0.5	Storage / Support / Service	Excellent	6	Steel Frame	Metal	Elec Heat	Infrastructure	Keep
114	Main Hill	R	Nitrogen Seperation	0.03							Infrastructure	Remove
63E	Test Fire	C	Quality/Product Test								Keep	Keep
63W	Test Fire	C	Quality/Product Test	16.5	Lab / R&D / Lt. Ind	Excellent	15	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
A	Main Hill	N	Administration	55.6	Office / Administration	Good	47	Masonry Ext Walls, Alum Window	BUM Roof Asphalt	Central Steam, Chilled Water	Keep	Keep
B	Main Hill	R	Adv Dev Inert Prod	27.7	Lab / R&D / Lt. Ind	Good	47	Masonry Ext Walls	BUM Roof Coaltar & Carboline	Central Steam, Chilled Water	Maybe	Keep
C	Main Hill	P	Records Storage	13.4	Lab / R&D / Lt. Ind	Fair	47	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Remove	Remove
COS	Main Hill	Q	Central Ops Supp	64.7	Lab / R&D / Lt. Ind	Excellent	9	Steel Frame Brick Veneer	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
DS	Main Hill	Q	Dev. & Stds. Lab	47.8	Lab / R&D / Lt. Ind	Fair	29	Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water	Keep	Keep
E	Main Hill	P	Adv Dev Production	29.8	Lab / R&D / Lt. Ind	Fair	47	Masonry Ext Walls	BUM Roof Coaltar PH2-MET	Central Steam, Chilled Water	Maybe	Remove
E-Annex	Main Hill	P	Offices	18	Lab / R&D / Lt. Ind	Fair	47	Masonry Ext Walls	BUM Roof Coaltar PH2-MET	Central Steam, Chilled Water	Maybe	Remove
EG-1	Main Hill	R	Electrical Generator	0.24	Storage / Support / Service						Remove	Remove
EG-2	SM-PP	F	Electrical Generator	0.24	Storage / Support / Service						Remove	N/A

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
EG-4	Main Hill	Q	Electrical Generator	0.14	Storage / Support / Service						Remove	Remove
EG-6	Main Hill	R	Electrical Generator	0.24	Storage / Support / Service						Remove	Remove
EG-7	Test Fire	C	Electrical Generator	0.08	Storage / Support / Service						Remove	Remove
G	Main Hill	O	Garage	7.5	Storage / Support / Service	Fair	47	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Wind AC	Keep	Keep
GH	Main Hill	H	Employment	5.3	Office / Administration	Good	47	Masonry Ext Walls	BUM Roof Coaltar	Central Steam Package HVAC Units	Keep	Keep
GIS	Main Hill	H	Guard Island	0.2	Office / Administration	Fair	47	Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC	Remove	Keep
GP1	Main Hill	N	Guard Post #1	7.8	Storage / Support / Service	Good	46	Reinforced Concrete Brick	BUM Roof Coaltar & Asphalt & Carboline	Central Steam, Chilled Water Package HVAC	Remove	Keep
GP44	SM-PP	F	Clothing Issue	0.4	Storage / Support / Service	Fair	32	Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC	Remove	Remove
GW	Main Hill	O	Bonded Stores	9.8	Lab / R&D / Lt. Ind	Fair	27	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
H	Main Hill	P	Laundry	17.3	Storage / Support / Service	Fair	47	Masonry Ext Walls	BUM Roof Asphalt Coaltar	Central Steam, Chilled Water	Remove	Keep
HH	Main Hill	Q	Isotope Separation	15.3	Lab / R&D / Lt. Ind	Good	47	Reinforced Concrete	BUM Roof Coaltar Metal	Central Steam, Chilled Water	Remove	Remove
I	Main Hill	R	High Expl Prod	25.7	Lab / R&D / Lt. Ind	Poor	47	Masonry Ext Walls	BUM Roof Coaltar Asphalt Rolled Metal	Central Steam, Chilled Water	Maybe	Keep
M	Main Hill	P	Machine/Elect Shops	56	Lab / R&D / Lt. Ind	Good	47	Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam, Chilled Water	Maybe	Keep
OSE	Main Hill	N	Opns Supp (E)	90.1	Office / Administration	Excellent	9	Steel Frame, Brick Veneer, Alum Wind	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
OSW	Main Hill	N	Opns Supp (W)	54.3	Office / Administration	Good	21	Masonry Ext Walls, Alum Wind	BUM Roof Coaltar	Central Steam, Chilled Water	Keep	Keep
P	Main Hill	O	Power House Main Hill	15.1	Storage / Support / Service	Adequate	47	Masonry Ext Walls	BUM Roof Carboline Coaltar	Central Steam, Package AC, Wind AC	Infrastructure	Keep
PH	Main Hill	C	Power House	0.646	Storage / Support / Service	Adequate	47	Masonry Ext Walls	BUM Roof Coaltar	Central Steam	Infrastructure	Keep
PS	Main Hill	O	Paint Shop	2.3	Storage / Support / Service	Good	32	Prefab\Metal\Modular	Metal	Central Steam	Remove	Remove
R	Main Hill	R	Research Lab	55	Lab / R&D / Lt. Ind	Fair	46	Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water	Remove	Remove
SD	Main Hill	M	Sanitary Treatment (Not in Service)	1.6	Storage / Support / Service	Poor	47	Concrete	BUM Roof Coaltar	Central Steam Not in Use	Infrastructure	Remove
SM*	SM-PP	F	Demolished Nuclear Production Building	0	Lab / R&D / Lt. Ind						Remove	Remove
SST	SM-PP	E	Salt Storage	0.6	Storage / Support / Service	Adequate	22	Wood Frame		None	Infrastructure	Keep
SW	Main Hill	R	Tritium R&D	43.1	Lab / R&D / Lt. Ind	Fair	44	Masonry Ext Walls	BUM Roof Carboline Asphalt Coaltar	Central Steam, Chilled Water	Remove	Remove
T	Main Hill	Q	Nuclear Operations	173	Lab / R&D / Lt. Ind	Good	47	Reinforced Concrete	BUM Roof Carboline Asphalt Coaltar	Central Steam, Chilled Water	Remove	Keep

Building Database

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Condition 1997 CAMP	AGE (YRS)	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP	MMCIC Bldg. List 5 28-96	DOE Disposition
W	Main Hill	O	Maintenance Shops	32.5	Storage / Support / Service	Good	47	Masonry Ext Walls	BUM Roof Coaltar & Carboline & Asphalt	Central Steam, Chilled Water	Keep	Keep
WD	Main Hill	M	Radioactive Waste Treatment	16.2	Storage / Support / Service	Adequate	47	Concrete\Concrete Block	BUM Roof Asphalt Concrete	Central Steam, Chilled Water	Remove	Remove
WH1	Lower Area "B"	I	Well House	0.4	Storage / Support / Service	Good	47	Metal Ext Walls	Metal	Elec Heat	Infrastructure	Keep
WH2	Lower Area "B"	I	Well House	0.4	Storage / Support / Service	Good	35	Masonry Ext Walls	BUM Roof Coaltar	Elec Heat	Infrastructure	Keep
WH3	Lower Area "B"	I	Well House	0.1	Storage / Support / Service	Good	35	Masonry Ext Walls	BUM Roof Coaltar	Elec Heat	Infrastructure	Keep
			TOTAL	**1336.1**								

Section 3 - Infrastructure

Central Plant

The Central Plant (Building P) consists of two steam boilers, five chillers, two air compressors and associated support equipment for the boilers and chillers. The following table indicates the capacity, age and general condition of the boilers and chillers.

Equipment	Nominal Capacity	Age	Comments
Steam Boiler #1	70,000 #/HR @ 125 psig	27 Years	Good general condition. Anticipated service life 30 - 35 years.
Steam Boiler #2	85,000 #/HR @ 125 psig	14 Years	Good general condition. Anticipated service life 30 - 35 years.
Chiller #1	1,000 Tons w/ R-11	24 Years	Poor condition. Needs to be replaced if Plant demand increases.
Chiller #3	1,000 Tons w/ R-500	12 Years	Poor condition. Needs to be replaced if Plant demand increases.
Chiller #4	1,000 Tons w/ R-500	12 Years	Poor condition. Needs to be replaced if Plant demand increases.
Chiller #5	1,500 Tons w/ R-11	9 Years	Poor condition. Needs to be replaced if Plant demand increases.
Chiller #6	1,200 Tons w/ R-11	Approx 11 Years	Poor condition. Needs to be replaced if Plant demand increases.

Most of the ancillary equipment appears to be well maintained and in good operating condition.

The boilers operate at 125 psig and can fire either natural gas or fuel oil.

Electricity

Electric service is provided to one location at the Mound site by Dayton Power & Light Company (DP&L). Electricity is provided by three 15 kv circuits which operate together. The three circuits are rated at 4.5 MVA, 10.8 MVA and 6 MVA, and any two circuits can provide adequate electrical power to the Mound facilities.

Power is distributed to two major switchgear line-ups, referred to as the east and west line-ups. Each line-up has six circuit breakers which distribute power to 26 substations on the Mound site. Six of the substations are located at the Central Plant (Building P). The distribution system from the east and west main switchgear is by an underground manhole-duct bank system.

There are nine 480 volt emergency power generators on site. They are diesel fuel powered. Most have above ground fuel storage tanks.

Separate electric meters have not been provided for the buildings on site. In some areas, two or more buildings are served by one service. However, the power supply to the site is metered by DP&L.

Electric power can be delivered to the site for future conditions with no limitations on supply. DP&L would like to provide separate electrical service to the individual buildings.

Natural Gas

Natural Gas is supplied by Dayton Power & Light Company (DP&L) to the Mound site. The gas supply is delivered through a 6-inch high pressure pipeline from Mound Avenue. The pipeline is constructed above grade, is supported on stanchions and is in good condition. The pipeline conveys the natural gas to the Central Plant (Building P). There is no gas distribution system to other facilities on site.

Natural gas can be delivered to the site for future conditions with no limitations on supply. However, if a gas distribution system is developed, pipeline construction will encounter shallow rock.

Steam/Chilled Water

Steam at 120 psig is distributed throughout the site via approximately 11,000 linear feet of exposed overhead piping. Steam condensate is returned to the Plant through piping routed in a similar manner. Approximately 600 feet of exposed piping is in need of repair. Several pipe stanchions need to be replaced.

A chilled water solution containing 30% glycol is also distributed through exposed overhead piping from Building P. This piping serves only 19 buildings in the Main Hill Area and the Test Fire Area. A separate Chilled Water Plant, Building 95, houses a 12 year old, 500-ton chiller and an 11 year old, 800-ton chiller which serve the SM-PP Area exclusively through an underground piping distribution system.

Apparently, underground rock formations limit underground pipe installation throughout most of the site including the Main Hill and Test Fire Areas. The overhead steam distribution system could be readily expanded if necessary. The chilled water system could not be readily expanded due to the higher pressure drops associated with this type of system.

Potable Water

The potable water system consists of on-site supply and distribution. Water is supplied from three wells located in the southwest section of the site. Well #1, constructed in 1962, has a capacity of 650,000 gallons per day (gpd). Wells #2 and #3, constructed in 1947, have a capacity of 790,000 gpd each. Wells #2 and #3 have direct drive propane gas engine backup. The wells are located within the 100-year floodplain of the Great Miami River. The pumps and motors are protected.

Water is drawn from the well field and pumped through two lines to Building 24, where the water is disinfected and softened. Water is delivered to the SM water tower, built in 1965, through booster pumps in Building 24. The SM tower, with a capacity of 250,000 gallons, provides water to the fire protection system. The separate fire protection system includes a 350,000 gallon ground storage tank.

The wells also deliver water to the Central Plant, Building P, where it is disinfected, softened and delivered to the 100,000 gallon Central Plant tower. The elevation of the floor in the Central Plant is 875. The overflow elevation of the Central Plant tower is approximately 1000, and the overflow elevation of the SM tower is 1068. The domestic water system has two pressure zones.

The average daily demand for water at the Mound is approximately 50,000 gpd. The water distribution system is cast iron pipe originally installed throughout the site. The system is comprised of:

- 8-inch pipe from the wells to Building 24 and Building P
- 6-inch pipe for distribution
- 3-inch supply to original buildings
- 4-inch supply to newer buildings

Most of the distribution system is looped, therefore providing flow to buildings from two directions. The operation of the system is controlled from Building P.

The site contains separate fire lines of asbestos cement (transite) pipe. The fire line system is also looped.

According to the Mound Infrastructure Assessment Report, the remaining useful life of the water system is approximately 10 years.

Wastewater

Domestic wastewater is collected and treated on the Mound site. The original collection system consists of vitrified clay (VC) pipe. These sewer lines are in adequate condition, and most have been surveyed by TV inspection. The collection system is subject to infiltration/inflow (I/I) problems (typical of older VC pipe systems); and, therefore, some of the original pipes have been replaced by ductile iron (DI) and polyvinyl chloride (PVC) pipe. According to the Mound Infrastructure Assessment report, the remaining useful life of the collection system is greater than 10 years.

There are six wastewater pump stations located throughout the site, generally dedicated to a particular building and located outside of the building. Most of the pump stations have two pumps each with pump motors ranging from 5 to 10 horsepower. The pumps are controlled by floats and some stations have alarm lights.

The wastewater treatment plant is located in Building SD and utilizes an extended aeration process followed by tertiary treatment. The influent flow is equalized, aerated, biologically treated, and clarified. The clarified effluent is sand filtered, disinfected through a chlorination/dechlorination system, and discharged to the Great Miami River through a 10-inch outfall pipe. The 10-inch outfall pipe has been sliplined.

Sludge from the clarifier is digested and delivered to storage tanks. The stored sludge is dewatered by a belt filter press approximately three times per year. Flyash is mixed with the digested sludge to increase solids content. The sludge can then be dewatered to a 40% - 50% solids content sludge cake and boxed for burial. The sludge has contained low level radiation.

The capacity of the Mound wastewater treatment plant is 160,000 gallons per day (gpd). The existing average daily flow to the plant from the Mound facilities ranges from 45,000 to 60,000 gpd.

Storm Water

Storm water is collected in the developed portions of the site by a limited amount of curb inlets and catch basins. Some areas have no concentrated collection point, relying instead on sheet flow to open side ditches along the roadways. Once the water leaves the immediate building or parking area, it is discharged into open channels. The majority of runoff is carried through the site in two channels. One channel serves the Main Hill Area and the northern halves of the Intermediate and Test Fire Areas. (The exception to this is the runoff from the big parking lot in the northeast corner of the site. It is collected by catch basins and discharged off-site to the north.) The second channel serves the remainder of the developed site.
There are two existing detention ponds on the developed site. One is a small holding pond next to the entrance to the site. It is a concrete-lined, fenced-in pond that collects storm water runoff from the section of the site currently being used by the DoE (Building

SM, etal.). Under normal conditions, no storm water is detained in this pond as the outlet gate is kept open. The gate is designed to be closed and the pond used as an emergency holding pond in the event of a hazardous or radioactive material spill and/or runoff contamination. This pond seems to be maintained on a regular basis and is in satisfactory shape. It must be noted, however, that this pond can not be considered as detention for anything but what it currently serves. It must continue to function as an emergency containment system as long as hazardous or radioactive materials are used in the DoE area.

The second pond is primarily a settling pond that is part of a system designed to control runoff and allow for the testing and monitoring of all collected site runoff. This lower system, located in the southwest corner of the existing site, receives all of the storm water collected from the site (except the large parking lot as noted above) including discharge from the upper holding pond. Under normal conditions, runoff is allowed to flow through sluice gates and holding tanks to be tested for contaminants and monitored for off-site low rates. During significant storms, the runoff is diverted to the settling pond. This pond has a design capacity of approximately 3.1 million gallons and is equipped with an overflow alarm system. The gate/holding tank system is aging and is a system that seems to have developed over a period of time with additions and retrofitted monitoring equipment. According to the Mound staff, the settling pond is at or under capacity now for the developed site. Since it is a settling pond and thus remains full, it cannot be used in calculating detention area without redesigning the entire system. Note that the entire site operates under an EPA National Pollution Discharge Elimination System (NPDES) Permit that is due to be updated and renewed this year (1996).

Any new development will require additional storm sewer collection system design and detention/off-site discharge design. Any roadway construction or improvement will include the addition of curb and gutter thus requiring a storm water collection system. Again, all off-site discharge must be coordinated with the NPDES Permit.

Streets and Roads

Primarily based on width and destination, 20% of the existing roadways can be classified as main access roads, 70% as secondary access roads, and 10% as service drives. In general, all of the roadways are in too poor a condition and too narrow for the anticipated redeveloped use of the site. About 15% *could* be acceptable for current and future use but are too narrow to meet current standards and are estimated to have a useful life of only 5 to 10 years.

Topography of the site has resulted in some poor intersection geometry that will, in at least one case, be very difficult to improve within the same intersection area. On the Main Hill, intersection improvements will require establishing one-way traffic, rock excavation and retaining walls.
The majority of the main access roads are concrete base with asphalt overlays. The concrete base seems to be, based on visual surface inspection, good enough for future use. This evaluation cannot be completed without pavement cores to determine the condition of the concrete and subbase material as well as the effectiveness (or existence) of the subbase

drainage. Most, if not all, of the joints in this concrete base will require repair if the concrete base is to remain.

There are a few areas with curbs and sidewalks found within the Main Hill Area. All other areas do not have curbs and walks. Pedestrian ways and utilities between buildings will increase the difficulty of widening to meet current Miamisburg development and roadway standards.

Section 4: Market Assessment

Introduction

Economics Research Associates (ERA) was engaged by Sasaki Associates to analyze the economic and financial feasibility of converting a Department of Energy (DOE) facility in Miamisburg, Ohio, into a research center and business park development. The existing DOE facility, known as the Miamisburg Mound, has been utilized since the 1940's for nuclear energy research and weapons development. The property is currently improved with roughly 132 buildings of varying age and condition, covering roughly 1.4 million square feet of floor area on a 306-acre site; roughly 124 acres of the property are undeveloped. The earliest mound improvements, including office, warehouse, explosives storage, and research lab space, were built between 1948 and 1970. Additional testing and administrative space was built as new missions were allocated to the DOE facility, with the most recent additions occurring in the late 1980's. The existing improvements also contain state-of-the-art testing and analysis equipment, which has commercialization potential. However, the Mound has also been classified as a Superfund site, due to the existence of radioactive and chemical wastes, which will be remedied by DOE over the next 10 to 15 years.

Interest in redevelopment of the mound facility emerged with the end of the cold war, when DOE initiated a program to downsize their nuclear energy research facilities across the United States. The Miamisburg Mound was one of several facilities identified for downsizing and closure, to occur over a period of years, depending on project funding and environmental remediation requirements. The Miamisburg Mound Community Improvement Corporation (MMCIC) was formed by the City of Miamisburg to oversee redevelopment planning for the Mound. In trying to convert the research facility into a commercial venture, the corporation's primary goal was to preserve the existing base of high-technology research and testing equipment, while creating new employment opportunities for DOE researchers and scientists. Creation of new jobs for Mound employees is critical, because all employees who work in Miamisburg pay a percentage of their income taxes to the City of Miamisburg; the city could lose a minimum of $800,000 in annual revenue if the mound facility were to close outright. MMCIC reuse plans also include development of the 124-acre vacant tract as a business park, creating additional employment and tax revenues.

Analysis of redevelopment potential for the Miamisburg Mound will look at the age and condition of existing site improvements, identify and evaluate development issues relevant to the site's commercialization potential, and ultimately generate projections of operating expenses and revenue for the redeveloped facility through a 10-15 year transition period, as the property is converted to civilian use. The market study will incorporate discussion of relevant socio-economic trends in the Dayton MSA, including job creation and new business activity. Discussion of local real estate development activity will include inventory growth, absorption, vacancy, and lease rates for commercial property. Analysis of commercial applications and marketability for Mound technologies will also occur.

Regional Perspective

The Miamisburg Mound is located south of downtown Dayton, west of I-75 in the City of Miamisburg, which is in Montgomery County, Ohio. The site is roughly three miles west of the Route 725 interchange with I-75, which is the primary interstate access point for local traffic in the area. The I-675 Dayton by-pass is located just south of the Rt. 725/I-75 interchange, providing the Miamisburg area with excellent interstate access. Proximity to I-75 is particularly important; I-75 is considered one of the primary industrial corridors in the U.S., particularly for the auto industry and related manufacturers. The area surrounding the I-675/I-75 interchange has emerged as a concentration of suburban Dayton office and industrial space development, while the I-75/Rt. 725 interchange has emerged as a large suburban retail area, anchored by the Dayton regional mall. A map on the facing page delineates the individual jurisdictions in relation to the subject property.

Socio-Economic Overview

Analysis of socio-economic trends and forecasts for the Dayton MSA provides a necessary context for assessment of the redevelopment feasibility of the Miamisburg Mound. Such indicators highlight previous areas of economic strength and weakness, as well as areas with future growth potential in the region. This section will highlight historic population, employment, major employers, and business start-up activity in the Dayton MSA. Specific emphasis will be placed on employment trends in manufacturing sectors of the regional economy, as well as demographics for Montgomery County, including the City of Dayton and Miamisburg Township.

Before reviewing socio-economic indicators for the study area, it is important to mention that the Dayton area has historically been synonymous with manufacturing and technological innovation. Dayton area inventors were responsible for several major innovations, including the auto self-starter, the airplane, and the cash register, in the early 20th Century. Such inventions had a particular impact on the Dayton area beginning in the 1920's, as such firms as General Motors, Chrysler, and National Cash Register (NCR) expanded their manufacturing facilities in the Dayton area. According to the Wall Street Journal, technological innovation in the Dayton area has remained strong since the 1920's, resulting in such commonplace items as storage batteries, liquid crystal displays, photocells, and inkjet printers.[1]

The extent of technological innovation associated with the Dayton area is significant when considering the redevelopment potential of the Miamisburg Mound. The Dayton area is currently home to two research and development (R&D) centers, the Miami Valley Research Park and the Air Force Wright Laboratory, as well as four universities, including Wright State and the University of Dayton. ERA research into R&D center development in other cities indicated that R&D activity tends to concentrate within a region in order to take advantage of locational economies, such as an existing specialized labor supply and available research facilities.[2] As such, a redeveloped Mound site would hold promise for R&D activity, given the local history

of innovation, as well as the existence of local universities and independent research centers in the region.

Population

The Dayton Metropolitan Statistical Area (MSA) covers four counties in west central Ohio: Montgomery, Greene, Clark, and Miami. The following table highlights county population levels in the MSA since 1960. The table shows that Green County, located east of Montgomery County, has experienced the highest amount of absolute population growth between 1960 and 1995, growing by more than 46,500 persons overall.

Table 1: County Population Estimates, Dayton MSA, 1990 - 1995

County	1960	1970	1980	1990	1992	1995	Change 1960 - 1995
Montgomery	527,080	608,413	571,697	573,809	576,836	570,490	43,410
Greene	94,642	125,057	129,769	136,731	139,397	141,181	46,539
Clark	131,440	157,115	150,236	147,548	147,617	147,731	16,291
Miami	72,901	84,342	90,381	93,182	94,842	97,010	24,109
MSA Total	**826,063**	**974,927**	**942,083**	**951,270**	**958,692**	**956,412**	**130,349**

Source: Miami Valley Regional Planning Agency

Although Montgomery County grew at a substantially faster rate between 1960 and 1970, (increasing by over 80,000), the county was unable to maintain such rapid growth over the long term. By 1980, population in Montgomery County had fallen by about 36,000, negating about 45% of incremental population growth achieved in the county between 1960 and 1970. Greene County also recorded a population surge between 1960 and 1970, growing by more than 30,000. Overall, the Dayton MSA grew by roughly 150,000 between 1960 and 1970, which is equivalent to annual growth of about 1.7% over the ten-year period. Since 1970, the Dayton MSA has experienced inconsistent growth, recording increases in population between 1980 and 1990, and population decreases between 1970 and 1980, as well as 1990 to 1995.

The extent of population decline in the Dayton area between 1970 and 1980 was particularly strong, falling by about 32,000. Although a variety of factors certainly influenced the rate of MSA population decline during that period, one source indicated that the Dayton area also experienced a period of considerable economic instability in the 1970's and early 1980's, which resulted in a loss of roughly 50,000 manufacturing jobs in the metro area.[3] Beginning in the 1970's, the U.S. economy was increasingly influenced by international competition; NCR, a major employer in the Dayton area, began moving jobs abroad at this time in search of lower labor costs, resulting in a loss of over 20,000 jobs by the mid-1980's.

Localized Demographics

The primary area of interest in this study is Montgomery County, which contains roughly 70% of MSA employment and 60% of MSA population. The following table highlights 1990 census data and 2015 forecasts for population, households, and employment in several civil divisions of Montgomery County. The 2015 forecasts were generated by the Miami Valley Regional Planning Commission. The table shows that Miami Township had a 1990 population of about 40,700, which is forecast to grow beyond 48,000 by 2015.

Table 2: Socio-Economic Indicators and Forecasts for Civil Divisions in Montgomery County, 1990 and 2015

	Population		Households		Employment	
Civil Division	1990	2015	1990	2015	1990	2015
Miami Township	40,700	48,559	16,457	19,673	18,509	26,888
Washington Twp.	46,609	57,919	18,149	22,328	16,920	17,334
City of Moraine	5,989	6,905	2,299	2,632	13,640	13,757
City of Kettering	60,569	61,608	26,098	26,428	32,710	32,999
City of Dayton	182,044	175,917	72,670	69,912	153,593	155,541
Montgomery County	573,809	607,000	226,192	237,532	303,200	319,000

Source: Miami Valley Regional Planning Commission

Employment growth in Miami Township and the City of Miamisburg is forecast to exceed 8,400 jobs, which is the largest increase among the listed civil divisions in Table 2. The table indicates that roughly 50% of forecast employment growth in Montgomery County through 2015 should occur in Miami Township; the township has already emerged as a center of suburban office and retail development, which is concentrated around the I-75/I-675 interchange. The City of Dayton is forecast to retain a consistent share of county total employment through the forecast period, accounting for about 50% of total employment by 2015. However, Dayton is also forecast to lose population, about 6,100 residents, over the same period. Conversely, Washington Township is forecast to capture about 35% of county population growth through 2015, while adding only about 400 new jobs. Table 2 indicates that, by 2015, The Cities of Dayton and Kettering, along with Miami Township, will contain roughly 68% of total county employment.

Employment Trends

Discussion of employment trends for the Dayton MSA provides insight into how the regional economy has changed since the 1970's. Table 3, which highlights employment trends by industry sector between 1980 and 1994, shows that the MSA experienced considerable jobs losses in the early 1980's, in excess of 21,000 positions. The table also highlights the extent of economic recovery in the region beginning in 1984 and continuing through 1990, when roughly 75,000 new jobs were created in

the Dayton area. Job creation between 1990 and 1994 was considerably slower, with only about 6,800 additional jobs created.

Table 3 also shows that job creation since 1983 in the Dayton area has occurred in several sectors, including manufacturing, wholesale & retail trades, services, and government. Of the 75,000 new jobs created between 1983 and 1990, almost 45% were in services, and 27% were in wholesale & retail trades. Manufacturing employment recovered considerably in the 1983 to 1985 period, growing by 10,600 jobs. Since 1985, however, manufacturing job creation has fallen, with a loss of about 3,400 jobs by 1990, and an additional 5,900 by 1994. The table shows that manufacturing's share of total employment has decreased overall, from a high of 31% in 1980 to 23% in 1994. Conversely, service sector employment has grown considerably, growing from about 21% of MSA employment in 1980 to 28% in 1994. Expansion of service sector employment in the Dayton economy is consistent with national trends.

Table 3: Covered Employment Trends by Industry Sector, Dayton MSA, 1980 - 1994

Industrial Sector	1980	1983	1985	1990	1994	Absolute Employment Changes			
						80-83	83-85	85-90	90-94
Mining	448	277	343	422	665	-171	66	79	243
Construction	14,922	10,669	13,414	15,218	15,505	-4,253	2,745	1,804	287
Manufacturing	110,907	95,604	106,254	102,854	96,896	-15,303	10,650	-3,400	-5,958
T.C.U	14,750	13,374	14,052	17,758	18,390	-1,376	678	3,706	632
Trades	82,740	80,662	89,704	101,407	105,130	-2,078	9,042	11,703	3,723
F.I.R.E.	15,572	15,715	16,428	16,962	16,968	143	713	534	6
Services	72,285	76,942	87,120	110,058	115,458	4,657	10,178	22,938	5,400
Government	44,685	41,795	41,221	44,759	46,714	-2,890	-574	3,538	1,955
Other	1,870	1,993	2,488	3,698	4,213	123	495	1,210	515
Total	358,179	337,031	371,024	413,136	419,939	-21,148	33,993	42,112	6,803
Manufacturing %	30.96%	28.37%	28.64%	24.90%	23.07%				
Services %	20.18%	22.83%	23.48%	26.64%	27.49%				
Government %	12.48%	12.40%	11.11%	10.83%	11.12%				

Note: Table includes covered employment, following Ohio unemployment compensation law.
Source: Ohio Bureau of Employment Services, Labor Market Information Division

Government employment, concentrated primarily at Wright-Patterson Air Force Base, has had an overall stabilizing influence on the local economy, occupying a relatively consistent share of about 11% of MSA employment between 1980 and 1994. Although government employment activity is generally insulated from market forces, changes in government policy can have a considerable effect on employment levels. Policy decisions by DOE and the military to close or reduce staff at the Defense Electronics Supply Base and the Miamisburg Mound in 1993 resulted in a loss of roughly 3,400 civilian and military jobs in the Dayton area.

Although manufacturing employment creation has not kept pace with service sector employment growth in the Dayton area, it would be incorrect to assume that the local manufacturing base is in decline. Table 4 highlights employment trends for specific manufacturing employment sectors between 1992 and 1995. The table shows that total durable goods manufacturing occupies roughly 75% of total manufacturing employment in the Dayton MSA. The two largest durable goods sectors are industrial machinery & equipment (SIC 35) and motor vehicles and equipment (SIC 371); a total of roughly 6,100 new jobs were created in the two categories between 1993 and 1995, amounting to about 75% of total new manufacturing jobs created in the Dayton area over the same period. Although the manufacturing sector lost about 1,800 jobs between 1992 and 1993, a gradual economic recovery had created almost 8,000 new jobs in the metro area by 1995.

Table 4: Manufacturing Employment Trends, Dayton MSA, 1992 - 1995

					Absolute Change	
Manufacturing Sectors	1992	1993	1994	1995	1992-1993	1993-1995
Fabricated Metal Products	7,800	7,600	8,300	8,200	-200	600
Machinery & Equipment	29,300	28,500	29,400	30,800	-800	2,300
Electronic Equipment	3,200	3,300	3,300	3,400	100	100
Transportation Equipment	3,100	2,900	2,700	2,800	-200	-100
Motor Vehicles	17,700	17,100	17,200	20,900	-600	3,800
Total Jobs: Durable	69,500	67,800	69,900	75,600	-1,700	7,800
Food & Kindred Products	2,500	2,300	2,500	2,200	-200	-100
Paper & Allied Products	5,300	5,200	5,200	4,800	-100	-400
Printing & Publishing	8,000	8,500	8,400	8,600	500	100
Rubber & Plastic	7,300	6,900	7,500	7,100	-400	200
Total Jobs: Non-Durable	26,100	26,000	26,800	26,200	-100	200
Total Manufacturing Jobs	95,600	93,800	96,700	101,800	-1,800	8,000

Source: Dayton Area Chamber of Commerce and Ohio Bureau of Employment Services

In analyzing changes in manufacturing employment, it should be noted that improvements in manufacturing productivity have been considerable in recent history; between 1982 and 1992 manufacturing output in Ohio increased by about 50%, while employment remained roughly constant.[4] The impact of increased productivity is demonstrated by a Dayton area services company, Reynolds & Reynolds, who achieved a $200 million increase in annual sales without a commensurate increase in employment during 1995.[5] Several sources indicated that manufacturing productivity improvement will continue in the future, limiting the potential for future expansion of manufacturing employment in the region.

The amount of productivity improvement achieved by local firms, such as Reynolds & Reynolds, has enabled them to become more competitive, particularly in international markets. A recent survey conducted by the Center for Urban and

Public Affairs at Wright State University indicated that roughly 40% of surveyed manufacturing firms in the Dayton area export to other countries. The extent to which local firms export is important because it helps to insulate the local economy from regional and national economic downturns. Since a key ingredient in the rate of productivity improvement is the amount of technological innovation which occurs in a given area, successful redevelopment of the Mound facility as an R&D/business park would, in theory, enhance the Dayton area's competitive position regionally, and lead to increased economic stability.

Major Employers

In discussing the current employment situation in the Dayton metro area, it is important to denote the extent to which employment is concentrated in a small number firms. The following table highlights a sample of major employers in the Dayton MSA. The table shows that two employers, Wright-Patterson Air Force Base and General Motors (GM), employ a total of over 40,000 people in the Dayton area. GM currently maintains 10 factories in the Dayton area, producing sport utility vehicles, chassis systems, air conditioning components, powertrains, air bags, and other components. Wright-Patterson Air Force Base houses the Air Force Materials Command, the Wright Laboratory, and the Aeronautical Systems Center.

Table 5: Sample of Major Employers in the Dayton Metro Area

Employer	Product or Service	Employment
Wright Patterson Air Force Base	Military Installation	23,000
General Motors	Auto Manufacturing	20,000
Airborne Express	Freight Forwarding	6,000
NAVISTAR	Truck Bodies	5,500
Montgomery County	Government	4,750
AK Steel Corporation	Steel Mill	4,200
Kettering Medical Center	Hospitals	3,500
City of Dayton	Local Government	3,000
University of Dayton	University	2,500
LEXIS-NEXUS	Information Services	2,200
Emery Worldwide Airfreight	Freight Transport	2,000
Dayton Thermal Products	Auto Parts	1,600
Allied Signal Spark Plug Group	Auto Parts	1,050

Source: Dayton Area Chamber of Commerce, 1995 survey.

A third firm, LEXIS-NEXUS, is an electronic information services firm located in Miami Township. The company, which provides database and information services on the internet, was spun-off from its parent company, Mead Corporation, and sold to Reed-Elsevier in 1993. The company, which has experienced considerable growth since 1993, is located in a large campus development along I-75 south of Dayton.

Emery Worldwide operates a large distribution facility at the Dayton International Airport. Smaller manufacturing firms include Spectra-Physics (Laser systems) and Matsushita Electronics Corp. (CRT displays). The Dayton area is also home to a substantial number of companies which are involved in 'high technology' industrial sectors. One such company is Motoman, Inc., a West Carrollton-based robotics manufacturer, which now controls about 30% of the U.S. market for robotics devices. The company provides robots for use in welding and materials handling applications.

A 1996 survey of high technology in the Dayton area, conducted by the Center for Urban and Public Affairs at Wright State University, identified a substantial variety of high tech areas in which Dayton area companies are active, including software development, computer services, instrument manufacturing, consulting services, and bio-technology. In addition, the Dayton area is home to a large number of defense contractors working at Wright-Patterson or other installations. Roughly 50% of the surveyed high-tech respondents identified themselves as defense contractors. High-tech firms tend to be a primary focus of local economic development efforts, due to the typically higher value added created by such firms, in terms of higher salaries, as well as personal and real property tax revenues.

Regional New Business Creation

While employment levels maintained by large firms, including General Motors, are frequently tied or associated to the overall health of the local economy, a superior indicator of overall economic health is the rate of new business startup activity in the region. The following table identifies the number of net new businesses created in the four-county MSA region between 1989 and 1994. The table highlights the impact of the national recession on the Dayton area in 1992, when more businesses failed then were created. However, the regional economy recovered rapidly by 1993, with the creation of 322 net new businesses. The rate of new business formation grew further in 1994, when 453 net new businesses were started.

Table 6: Business Start-Up and Termination Activity, Dayton MSA

County	1989	1990	1991	1992	1993	1994
Montgomery	72	149	80	-22	137	264
Clark	34	18	-24	-34	82	14
Greene	10	1	-32	34	81	126
Miami	-9	12	36	-6	22	49
Total	107	180	60	-28	322	453

Source: Ohio Department of Development

From a county perspective, the table shows that Montgomery County has received the majority of net business start-up activity, averaging 113 new businesses on a yearly basis since 1989. In 1994, the extent of net business creation in Montgomery County was particularly strong, with 274 net business formations occurring. Greene

County emerged as a second area of new business activity after the recession, with 126 net business formations in 1994. Discussions with local officials indicated that increased use of property tax abatements to attract new firms is one reason for the recent surge in new business formation activity in the MSA.

Conclusions

In reviewing the range of socio-economic and demographic indices denoted above, it should be emphasized that the Dayton area is not expected to grow considerably in terms of total population or employment over the next five to ten years. Within the Dayton area, however, current forecasts indicate that the Miamisburg area is expected to capture a considerable share of expected regional employment and population growth. Although the Miamisburg Mound site is handicapped by limited interstate access, the property is located in a high growth area, enhancing its attractiveness for development. Also, the Dayton area still has a long history of technological innovation, which has enhanced manufacturing productivity in particular and improved the international competitiveness of local firms. Employment tied to Wright-Patterson Air Force base has also helped to diversify the local economic base beyond outright dependence on manufacturing sectors.

Real Estate Market Trends

Judgment of the potential for redevelopment of the Miamisburg Mound as a R&D/business park is tied primarily to analysis of real estate trends in the Dayton area. Documentation of local real estate activity, including inventory growth, absorption, vacancy, and lease rates, for local office, industrial, and R&D markets establishes a context for determination of the marketability for a redeveloped mound site. In establishing a context for marketability, the analysis will incorporate discussion about the age and condition of existing improvements on the Mound and evaluate development issues relevant to the site's commercialization potential. One particular issue is the marketability of existing high-tech research and testing equipment utilized by DOE employees on the Mound; ERA research will determine if market demand exists for reuse of this testing equipment. Conclusions generated from the market analysis will be used to support projections of operating expenses and revenue for the redeveloped facility through a 10 to 15 year transition period, as the property is converted to civilian use.

Statistics pertaining to development trends in local office and industrial markets were obtained from two sources, The JEM Real Estate Group and the Society of Industrial and Office Realtors (SIOR). The real estate reports published by both sources provide a general picture of development activity in the Dayton area. ERA chose to make only general comparisons between the two data sources, due to possible inconsistencies relating both to property classification and submarket areas covered in each report. Real estate market data generated by JEM Real Estate was used as the primary source for this section. Background information covering local real estate was obtained from area brokers, the *Midwest Real Estate News*, and the *Dayton Business Record*.

Real estate surveys conducted by the JEM Group cover metropolitan office and industrial markets in 1994 and 1995 for five Dayton-area submarkets. The JEM office space survey includes multi-tenant and medical/professional buildings; the majority of single tenant and government office buildings are not covered in the survey. The industrial survey includes investment grade industrial and warehouse properties which are generally larger than 20,000 square feet only. Discussion of real estate trends in the Dayton area will examine office, industrial and R&D real estate development at the metro area level, before focusing specifically on development activity in the southern submarket of Dayton, which includes Miamisburg, Moraine, Kettering, and Centerville.

Market Overview

Commercial real estate development in the Dayton area has historically been tied to manufacturing and industry. Local firms, including General Motors and Chrysler, have large manufacturing facilities in the area, with related smaller firms providing sub-components and spare parts. As a result, when manufacturing sectors in the area expand and add additional shifts, as they are now, the Dayton area industrial market tends to improve. Conversely, local office markets have been negatively impacted by a spate of corporate restructurings, which has reduced overall demand for office space and placed downward pressure on lease rates. Although leasing activity has been aided by defense contractors who provide services at Wright-Patterson Air Force Base, growth of such services is inconsistent, due to the nature of federal appropriations. As a result, the Dayton area office market remains largely stagnant, with small pockets of suburban growth, according to local real estate brokers. Local office markets are also suffering from over-building, which occurred in the late 1980's. Discussion of industrial space, research and development space, incubator space and office space markets will be provided.

Industrial Development Trends

The Dayton industrial market is concentrated primarily along I-75, north and south of downtown Dayton. The industrial submarket is dominated by large General Motors manufacturing facilities in Kettering and Moraine, two cities east and north of Miamisburg in the southern submarket of Dayton. The northern submarket has been growing in recent history, expanding northward beyond the I-75/I-70 interchange toward the cities of Troy and Vandalia. Overall, the Dayton area industrial market contains about 46 million square feet of owner/user and speculative industrial space, with the majority of space (about 75%) concentrated in suburban submarkets. The local market has recovered considerably from over-building in the 1980's, although the extent of improvement has tended to lag behind other Ohio cities, such as Cincinnati. By in large, the welfare of the Dayton industrial market is tied to the auto industry (General Motors); Cincinnati, about 40 miles further south on I-75, has a more diversified economy, which provides greater insulation from the influence of individual companies.

According to SIOR, the majority of growth in Dayton industrial markets has occurred in suburban areas; vacancy rates for suburban industrial space fell from 12.9% in 1992 to 8.8% in 1994. Although vacancy rates for industrial space in Dayton proper also declined over the same period, the amount of vacant space remaining was still considerable, roughly 15.4% by 1994. Suburban industrial space absorption in 1993 and 1994 was consistent, averaging roughly 900,000 square feet per-year, with the majority of new leasing activity occurring in warehouse and manufacturing; absorption of R&D space was minimal 1994. Suburban markets have remained strong through the second quarter of 1995, with vacancy rates falling to roughly 6% and net absorption of about 400,000 square feet, according to the 1995 JEM market survey.

Lease rates for different industrial property types in the Dayton market vary considerably, based on location, building age & design, and percentage of office build-out. Recently built, investment-grade, light manufacturing, warehouse, and/or distribution buildings with proximate interstate access, and 5% to 10% office buildouts are leasing for between $4.00 and $4.50 per square foot (net). Older industrial product, typically with restricted interstate access, leases for between $2.65 to $3.75 per square foot (net). Higher quality R&D/flex space, usually incorporating a larger office space build-out, typically leases for between $7.00 and $9.00 per square foot (net), with premium space achieving higher lease rates.

Operating expenses for industrial property, which can vary considerably depending on building use, typically range between $2 and $4 per square foot, with utilities accounting for between $1.00 to $1.75 per square foot. Local brokers indicated that tenant improvement allowances are typically not given for newer industrial space. In situations where such allowances are given, primarily for older space, allowances of $2 and $15 per square foot for warehouse and office space, respectively, are typical. For older industrial space, tenant allowances could be used to defray costs associated with building code upgrades. Otherwise, the majority of industrial tenant improvements are typically paid by tenants, amortized over the term of the lease.

Although indicators for suburban industrial markets are positive overall, there is a considerable amount of existing warehouse and light manufacturing space which will go on the market in the near future. About 245,000 square feet of existing warehouse/light industrial space at the Moraine Business Center is under renovation, with new interior treatments and facades; the space is being marketed at $2.75 per square foot. Of particular interest is the former Defense Electronics Supply Center (DESC) in Kettering, which was recently closed by the Base Realignment and Closure Commission. The base, which covers about 165 acres, is improved with roughly two million square feet of 1940's vintage warehouse and office space. The City of Kettering is expected to receive title to the DESC facility in January of 1997.

Discussions with City of Kettering officials indicated that about 500,000 square feet of space at DESC will be demolished; the official indicated that the warehouse space, about one million square feet, is structurally in "good shape", and would be expected to lease-up after necessary infrastructure improvements are made, primarily to existing

HVAC and utility systems. However, the layout of industrial space at DESC, in long, narrow buildings, would tend to limit their use to larger manufacturing or distribution oriented users who need more than 100,000 square feet of contiguous space. The DESC reuse plan also identifies about 400,000 square feet for office development in two buildings. The reuse plan indicated that the office buildings each have about 196,500 square feet of contiguous floor area; however, both structures do not have windows, and are realistically suitable only for larger, single-tenant occupancy.[6]

The DESC reuse plan identified office lease rates of $8/sq. foot (gross) or $3.50/sq. foot triple-net (NNN). Recommended industrial space lease rates would fall between $2.75 and $5.00 per square foot (gross), with smaller tenants paying a premium for leasing space. City of Kettering officials indicated that they would offer prospective tenants improvement allowances on a case by case basis, particularly if the tenant improvements add value to the property for future tenants.

Industrial Market Indices

ERA undertook an analysis of the 1995 JEM Real Estate Group survey to compare vacancy rates for competitive industrial space based on the year-of-construction. As industrial space at the Miamisburg Mound facility was built over a long time period, 1948-1987, such analysis will highlight both competitive supply as well as vacancy rates for older industrial product in the market based on building age. Table 7 highlights the resulting analysis for the Dayton metro industrial market.

Table 7 shows that the largest increment of space, roughly 2.7 million square feet, was delivered between 1975 and 1979. Space built in this period is also highly competitive, with only 3% vacant in 1995. Discussions with public affairs officials at General Motors, Inc. indicated that the company began to expand its facilities in the 1975 to 1979 period, spinning off their Fridgidare subsidiary, to concentrate on auto manufacturing. Roughly 27% of the current supply of competitive space in the Dayton area was built in the 1975 to 1979 period. The second largest increment of new space was delivered in the 1985 to 1989 period, when 1.85 million square feet was built.

Table 7: Dayton Area Speculative Industrial Space Inventory and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
before 1950	780,747	22,000	3%
1950 - 1959	1,103,395	95,000	9%
1960 - 1969	297,102	49,635	17%
1970 - 1974	727,759	82,608	11%
1975 - 1979	2,734,870	94,793	3%
1980 - 1981	723,557	105,000	15%
1982 - 1984	0	0	0%
1985 - 1989	1,859,482	103,901	6%
1990 - 1993	663,617	18,600	3%
1994	56,000	0	0%
1995	596,800	180,000	45%
1996	245,120	245,120	100%
Overall	9,788,449	996,657	10%

Note: Data is based on 1995 JEM real estate survey
Source: JEM Real Estate Group and Economics Research Associates

The 1985 to 1989 period in Table 7 corresponds to a time of considerable economic growth and real estate speculation in the region, following trends at the national level. 1995 vacancy rates for space built in the late 1980's are tight, running at about 3%. The table indicates a total competitive industrial space inventory of roughly 9.8 million square feet, with an overall vacancy rate of 10%.

Southern Submarket Industrial Development

An identical analysis of industrial space vacancy by year-built was conducted for the southern submarket of Dayton, in order to determine the age and supply of industrial space which might compete with the Miamisburg Mound. Table 8 shows that the southern industrial submarket contained roughly 4.8 million square feet of competitive industrial space, with an overall market vacancy of 13%. If vacant space delivered in 1995 and 1996 is excluded, current market vacancy would fall to about 4%. The table shows that almost 60% of the current industrial space inventory in the market area was delivered in two periods, 1975-1980 and 1986-1989. Current vacancy for the combined inventory of both periods is less than 5%. Table 8 excludes industrial space at the Miamisburg Mound and at the DESC facility in Kettering, which are two federal facilities in the Dayton area that are scheduled for reduction-in-force or outright closure. Combined, the two facilities contain over four million square feet of industrial, warehouse, and office space.

Table 8: Industrial Space Growth and Vacancy Trends, Southern Submarket, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
1950 - 1959	277,495	0	0%
1960 - 1969	130,500	2,900	2%
1970 - 1974	557,959	69,408	12%
1975 - 1980	1,355,015	15,371	1%
1981 - 1985	0	0	0%
1986 - 1989	1,203,057	97,907	8%
1990 - 1994	158,400	0	0%
1995	409,600	151,600	37%
1996	245,120	245,120	100%
Overall	**4,337,146**	**582,306**	**13%**

Note: Data is based on a 1995 JEM Real Estate survey
Source: JEM Real Estate Group and Economics Research Associates

Current redevelopment plans for both the Miamisburg Mound and DESC include demolition of functionally obsolete space, ±500,000 square feet at each location; as such, the amount of marketable office and industrial space at each location is not yet clear. While the DESC facility will be closed and transferred to the City of Kettering in its entirety by January of 1997, the City of Miamisburg will have to deal with ongoing DOE missions, administrative operations, and environmental clean-up at the Mound potentially through the year 2005, tying up a portion of office and industrial space. Due to the age and functional obsolescence of some improvements at the Mound, the supply of potentially marketable space is limited. Breakdowns of projected industrial, office, and R&D space availability at the Mound, as well as projected lease rates for each space category, will be provided in a later section of this report.

Overall, industrial development activity in the southern area of Dayton has become concentrated in three primary areas: Moraine, Miamisburg, and Springboro. The Moraine area is one of Dayton's primary industrial centers, containing extensive manufacturing facilities for General Motors, as well as larger distribution facilities. The Moraine area is mature, containing a largely older supply of industrial property, built mostly before 1980. As such, there is little-if-any vacant, unencumbered land suitable for industrial development in the area.

Available land further south along I-75 and I-675 in Miamisburg and Springboro became more attractive for development particularly in the 1980's. A large industrial development emerged at the Springboro exit on I-75 (W. Central Avenue) between 1986 and 1991, when over 500,000 square feet of distribution, warehouse, and flex/office space was built. The rate of development which occurred in the Springboro area in the 1980's was considerable; during a fieldwork assessment of the area, only two vacant industrial parcels were noted, covering a total of less than nine

acres. According to a local broker, the two parcels were listing for roughly $75,000 per acre. The area now has several high-profile tenants, including Pioneer (audio systems distribution) and Alcoa (metals processing). The Danis Company, a local developer, controls roughly 206 acres of land on the border of Montgomery and Warren Counties, south of Miamisburg; Although the company is trying to have the property annexed to Springboro, Montgomery County officials are trying to forestall the annexation, according to the Dayton Business News.[7]

A third concentration of south suburban industrial development has emerged in two sub-areas of Miamisburg, one being the I-75/I-675 area, and the other being the Miamisburg northern industrial district. Industrial space in the interstate corridor area was typically built in the late 1980's; the space is typically investment grade, multi-tenant space with office and industrial functions. According to local brokers, vacant land with industrial zoning and interstate frontage is currently listing for between $50,000 and $60,000 per acre. The supply of vacant land in competition with the Mound is located primarily at the intersection of Benner and Byers Roads in Miamisburg, east of I-75; the site contains roughly 165 acres and is zoned for industrial development. A second parcel, covering roughly 11 acres, is located east of I-75 along Lyons Road; the parcel is currently listed at almost $90,000 per acre.

An area of industrial activity in Miamisburg also emerged north of downtown along the Great Miami River. The area was zoned for light industrial activity and designated as a community reinvestment district, allowing companies which locate in the district to receive tax abatements and other incentives. Discussions with local brokers and city officials indicated that the district is nearly built-out, with one or two small parcels remaining. City officials indicated that, in one recent land sale in the district, two acres of industrial land went for about $250,000. The district, which is predominated by older single-tenant and owner/user industrial buildings, is roughly comparable to the Miamisburg Mound in terms of rail and interstate accessibility.

Mound Industrial Space Absorption Implications

The southern submarket of Dayton achieved annual absorption of roughly 300,000 square feet of owner-user and speculative space in 1993 and 1994, which was about 30% of total industrial space absorption in the Dayton area. The absorption indicators for 1993 and 1994 show considerable improvement over 1991 and 1992, when the Dayton area experienced overall net negative absorption, due in part to the national recession. Although ERA was unable to acquire absorption data for Dayton area office and industrial markets prior to 1990, the 1993 and 1994 absorption indicators provide a reasonable perspective on current demand in the market place, which is defined largely by restrictive lending requirements and conservative company expansion plans. Financing for new development is still tied primarily to pre-leasing requirements, as well as the credit-worthiness of tenants and developers. Discussions with local brokers would indicate that such circumstances will continue to define the nature of development activity in the Dayton industrial market through the near future.

According to local brokers, the majority of absorption has occurred in investment-grade industrial buildings, which are typically multi-tenant or build-to-suit properties, recently built, with 19 to 20 feet of clear warehouse ceiling height, dock-high truck access, and a minimal office build-out. Industrial space at the Miamisburg Mound, by comparison, is generally older, suffers from obsolescence, with varied office space build-outs, and cannot be considered investment grade. In addition, manufacturing and lab spaces at the mound tend to be over-engineered, i.e., built to unnecessarily high specifications. Most private sector applications do not require the excessive tolerances, reliability levels, and redundancies built into space and equipment for DOE applications at the Mound, which translates into higher operating costs for private-sector tenants without a comparable increase in value added. Also, a proportion of research and manufacturing facilities at the mound are suitable for only specific niche industrial activities, such as explosives testing.

Despite such problems, the Miamisburg Mound facility is located proximate to two interstate routes (I-75 and I-675), as well as existing concentrations of office and industrial development. Proximity to existing industrial and R&D activity is important in that it creates both economies of scale and location, which tend to attract additional firms to the area, in order to benefit from a skilled labor force, for example. In addition, the mound facilities also contain a substantial amount of unique, state-of-the-art testing and analysis equipment, which is now available for use. The existence of such equipment, some of which is highly specialized, is significant in that it may increase the geographic area from which the facility can attract tenants, providing the facility with a discernible competitive advantage.

As such, the use of conventional market capture rates, based solely on industrial absorption activity in the Dayton area, may understate potential demand for facilities at the Mound. In particular, likely demand for the range of advanced testing and analysis equipment at the facility will have a considerable influence over its redevelopment potential; a separate analysis of market potential for various high-technology applications of Mound equipment will be presented in an upcoming section.

It is ERA's contention that demand for mound space in the future will be driven primarily by the marketability of testing and research equipment as well as the skilled labor force at the mound. The combination of factors will generate considerable locational economies for future Mound users, increasing the attractiveness of the site for other high-tech businesses, who then can tap into a highly-skilled employment base. In order to remain competitive, however, MMCIC will need to offer below-market lease rates for all space categories and incorporate subsidies for operating costs or rent to attract and maintain smaller start-up tenants which typically operate with thin profit/loss margins. More importantly, this contention assumes that the DOE is able to remove all radiological contamination from the site. ERA is assuming that that the Mound site could capture a minimum of 50,000 square feet of industrial development per-year; the actual amount of absorption could be higher, given the reasons outlined above. Discussion of commercial applications for Mound equipment will occur in the next section.

Industrial Land Absorption Indicators

Redevelopment of the mound facility also includes development of several parcels, currently vacant or otherwise, covering a total of roughly 155 acres. About 120 acres of vacant land were purchased by the DOE in the 1980's for expansion, which never occurred. Current planning studies indicate that about 40% of this acreage is suitable for development, due to poor soils, exposed bedrock, and possible radiation contamination. The vacant acreage is also adjacent to the 100-year floodplain for the Great Miami River. In addition to the 124 acre parcel, other acreage will become available as buildings are demolished, making way for improved parking arrangements and infill building sites. Current MMCIC plans indicate that the vacant acreage will either be sold in bulk to a single developer, or sold as separate parcels. ERA is looking into build-to-suit or land lease arrangements as alternatives, which would enable MMCIC to maintain ownership and exert greater control over development activity on the Mound.

Calculation of probable land absorption rates for the mound facility was based on analysis of industrial space construction trends in the southern submarket between 1985 and 1995, as shown in Table 8. Between 1985 and 1995, a total of roughly 1,571,000 square feet of new industrial space was built. Assuming that the increment of submarket space was built at a 0.3 floor-to-area (FAR) ratio, it would amount to roughly 120 acres of land overall, or roughly 12 acres of absorption per year, on an average annual basis.

Assuming that road access to the mound is improved, that the land is priced at or below market rates, and that environmental cleanup efforts at the mound occur on schedule, absorption of land for business park development could begin by 1997 or 1998. Competitive pricing of vacant property will allow the mound to capture an increased share of absorption which would otherwise be captured by sites closer to I-75, including the 165-acre site at Benner and Byers Roads in Miamisburg, as well as other industrial acreage in Springboro. Discussions with local real estate specialists indicated that the City of Springboro has an aggressive policy of offering incentives, including tax abatements, for new industrial development; The City of Miamisburg would need to offer comparable incentives to be competitive. The mound could capture a minimum of 20% of submarket land absorption (roughly 2.5 acres per year) for industrial development, based on accessibility and proximity to the I-75/I-675 interchange, as well as the overall lack of competitive vacant land in the area by 1997.

The logic behind use of the 1985 to 1995 period for quantification of land absorption is based on the fact that local industrial markets were considerably over-built in the late 1980's, leading into a period of considerable instability in local industrial markets between 1990 and 1993, when new construction activity slowed dramatically. Use of the ten-year boom to bust to recovery cycle should be representative of overall demand for industrial land in the southern submarket.

Research & Development Space Trends

The Dayton metropolitan area has several concentrations of research and development activity. One primary center is the Miami Valley Research Park, a not-for-profit development on 1,250 acres of land in Kettering, just south of Wright-Patterson Air Force Base. The park was sponsored and planned by four area universities; the first research building was built in 1985. Development of the park was subsidized by a $20 million grant and donation of 675 acres by the State of Ohio. Currently, about 150 acres of the park have been developed with about 715,000 square feet of office, flex, and R&D space; vacancy is less than 4%. The park is planned for a 40 to 50 year build-out.

The park is geared specifically toward "scientific oriented manufacturing" targeting larger firms who are interested primary in the R&D stages of manufacturing, including prototype development and testing. The foundation has built speculative space for smaller tenants, and also sells land to owner/users, such as Kodak, for larger facilities. The executive director indicated that three new owner/user buildings are planned for construction by the end of 1996, totaling roughly 230,000 square feet. Quoted lease rates for speculative space in the park run $15 to $17 per square foot, full service. Operating expenses at the park typically run between $4.00 and $4.50 per square foot.

It is notable that, of the 35 tenants currently renting space at the park, about 23 are defense contractors who work at Wright Patterson Air Force Base. The amount of space used by defense contractors at the research park is significant in that it may confuse interpretation of Dayton area R&D absorption indices. Since contracts for government work are not infinite, and subject to political influence as well, the amount of government business captured by the research park does not provide a reliable indication of true market demand for R&D space in the Dayton area.

A second area of high-tech development has emerged around Wright State University, along Colonel Glenn highway in Fairborn. Several business parks, including the Wright Executive Center, have recently been developed in this area, which is adjacent to Wright-Patterson Air Force Base. The area has attracted both computer software development companies and defense contractors.

R&D Lab Space Absorption

Absorption of R&D space on the mound will largely be influenced by the status of activity at Wright-Patterson Air Force base. Assuming that more R&D functions are allocated to the Wright Laboratory, the overall health of the R&D space market will be enhanced, creating spin-off development that the Mound could capture. Depending on the availability of facilities and testing equipment, Mound lab spaces might capture regional absorption of up to 25,000 square feet. However, the actual rate of R&D space absorption will be based on market potentials in several high-tech industrial sectors which the Mound facilities were/are active. If markets that the Mound currently specializes in prove too small, or if the operating costs for mound

research facilities are prohibitively expensive, absorption will be considerably lower. Below-market lease rates will also need to be offered as an incentive.

Business Incubator Space Development

Business incubators provide subsidized office or industrial space for infant businesses who need extra financial help to get started. The Dayton Department of Economic Development is planning to build a 60,000 sq. foot incubator on an old General Motors site. The future building, planned for opening in December of 1997, will be geared toward high-tech start up firms. Although MMCIC does not have designated incubator status, the rent levels currently changed to a portion of Mound tenants are low enough to create the same incubator effect. A proportion of new start-up businesses at the Mound were formed by DOE employees. Discussions with City of Kettering officials indicated that a third incubator may be created at the DESC facility in Kettering, depending on the extent of leasing activity at the site.

Office Development Trends

While industrial markets in the Dayton area have largely recovered from recession in the early 1990's, the local office market has been slow to recover, primarily due to corporate restructuring at firms such as NCR, which has reduced overall demand for office space. The impact of a national economic recession, coupled with over-building in the late 1980's, has resulted in high vacancy rates for CBD and suburban office space since 1990. The Dayton CBD office market overall has suffered particularly in recent history, with overall vacancy of roughly 19%, out of a total inventory of 4.6 million square feet, according to the JEM Real Estate Group. Within the total CBD inventory, Class A space vacancy has improved considerably, from over 12% in 1994 to about 8.5% in 1995. Improvement in CBD class A space vacancy came at the expense of older buildings, as tenants have traded up for better space at comparable lease rates. As a result, Class B and C space vacancy in the CBD market stood at roughly 26% in 1995, showing slight improvement over 1994 levels. Current net lease rates for suburban office space range from $6 to $14 per square-foot, with operating costs contributing an additional $3.50 to $4.00 per square foot, depending on building age, condition, and location.

Table 9 highlights the amount of office space built in suburban markets between 1950 and 1995, noting current market vacancy for space built during each period. The suburban office market inventory studied by ERA included roughly 6 million square feet of space, with an estimated market vacancy of about 9%.

Table 9: Suburban Dayton Speculative Office Space Inventory Growth and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
before 1950	40,584	3,500	8.6%
1950 - 1959	95,289	5,500	5.8%
1960 - 1969	554,227	37,959	6.8%
1970 - 1974	372,181	94,243	25.3%
1975 - 1979	543,809	65,429	12.0%
1980 - 1984	765,557	94,943	12.4%
1985 - 1989	3,375,188	231,496	6.9%
1990 - 1992	124,138	0	0.0%
1993	0	0	0.0%
1994	40,620	22,620	55.7%
1995	75,000	0	0.0%
Overall	**5,986,593**	**555,690**	**9.3%**
Uncounted	308,207	80,735	26%

Note: Data excludes medical and professional office space
Source: JEM Real Estate Group and Economics Research Associates

Table 9 shows the extent of overbuilding which occurred in suburban office markets during the mid-to-late 1980's real estate boom. The table indicates that roughly 3.4 million square feet of office space was built in suburban markets between 1985 and 1989; current vacancy for space built in this period is strong, about 7%. The increment of office inventory growth between 1985 and 1989 now accounts for roughly 55% of total suburban office space inventories. Table 9 also highlights that fact that older suburban office product, built before 1984, exhibits higher vacancy. Office space built in between 1975 and 1984, which totals roughly 1.3 million square feet, was roughly 12% vacant in 1995. For space built in the 1964 to 1974 period, roughly 925,000 square feet, current vacancy is roughly 14%.

Table 10 highlights the analysis of vacancy by year built for the southern submarket of Dayton, which includes Miamisburg and Kettering. The table shows that the southern submarket contains roughly 3 million square feet of space, or about 50% of total suburban office inventories. Indicated market vacancy for space in the southern submarket is about 9%.

Table 10: Southern Office Submarket Speculative Office Inventory and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
Before 1959	114,974	6,000	5.2%
1960 - 1969	346,237	28,859	8.3%
1970 - 1974	251,752	28,268	11.2%
1975 - 1979	447,972	57,300	12.8%
1980 - 1984	198,712	37,920	19.1%
1985 - 1989	1,627,529	128,574	7.9%
1990 - 1992	49,870	0	0.0%
1993	0	0	0.0%
1994	0	0	0.0%
1995	35,000	0	0.0%
Overall	**3,072,046**	**286,921**	**9.34%**
Uncounted	183,252	23,120	12.6%

Note: Data is based on a 1995 JEM Real Estate office surveys.
Source: JEM Real Estate Group and Economics Research Associates

It is notable that about 53% of the total inventory in Table 10 was built between 1985 and 1990, which is consistent with the surge in office construction that occurred at the national level. In addition, office construction in the southern submarket between 1985 and 1990 accounted for almost 50% of total suburban office construction during that period. Table 10 indicates that the office space built in the 1985 to 1990 period is highly marketable, achieving a vacancy rate of roughly 8%. Office space built in the preceding five years (1980 to 1985) is apparently less competitive, with a vacancy rate of almost 20%. When taken in context with a depressed office leasing market after 1990, The stark contrast in vacancy rates for space built before versus after 1985 is significant in that it indicates that office tenants were able to move into new office space at attractive lease rates. The table also indicates that space built before 1970 is competitive, with only 34,000 square feet vacant (7%) out of a total inventory of 461,200 square feet. The fact that older office space appears competitive in the southern submarket is relevant with respect to the mound, which has over 200,000 square feet of office space dating back to the 1950's.

Office development has occurred at several locations in the Dayton suburbs. The I-75/I-675 area has emerged as a primary office node, anchored by three principle developments, The Lexis-Nexus Headquarters, Prestige Place, and the Newmark Office Center. The Lexis-Nexus headquarters is a multi-story campus style office development with frontage on I-75 south of I-675. The Newmark Center is a business park development further north along I-675, containing single story flex/office and multi story office space. The Prestige Place development contains two multi-story office buildings and vacant land, at the interchange of I-75 and Route

725. Older suburban office development concentrations are located along Kettering Boulevard and South Dixie Highway in Kettering.

Office Space Absorption Discussion

The local office market is still in a period of recovery, due to considerable overbuilding in the late 1980's, as well as corporate restructuring in the early 1990's, which reduced overall demand for office space. The southern office submarket inventory grew by over 3 million square feet over this time period. According to 1995 JEM real estate data, total suburban office absorption in 1994 was about 167,000 square feet. The southern submarket captured about 46% of total suburban absorption over the same period, roughly 65,000 square feet. Based on Table 10, office space construction in the southern submarket occurred at an average rate of 172,500 square feet per year.

Current information supplied by MMCIC officials indicates that the vast majority of office space on the mound will not become available until 2005, when DOE is supposed to vacate. Given annual submarket absorption of 167,000 square feet, ERA would assume that the Mound would capture annual absorption of up to 30,000 square feet of office space, primarily for Mound space which comes on line by 2000. Beyond 2000, realistic projection of market demand is risky at best, considering that office space under DOE control may not be maintained properly through the interim. In general, the Mound office space inventory suffers from generally inefficient and inflexible floor plans, with the oldest administrative space built along single corridors with double-loaded office spaces. The offices also lack modern amenities, including individual-room controlled HVAC.

Technology Assessment

In 1993, a report was prepared by the Center for Business and Economic Research at the University of Dayton School of Business Administration, called "Commercialization Study of the Mound Facility -- Phase I", which assessed the commercial potential of various technologies and capabilities at the Miamisburg Mound Facility. Seventeen Mound capabilities were placed in three categories according to their commercial potential. Group One technologies are those with the strongest, most immediate potential for commercialization. Group Two technologies scored somewhat lower on some important criteria. Group Three technologies lacked some key elements for short-term commercialization. The following list outlines the identified technologies.

Group One

- Ceramics
- Flexible Circuits
- Machine Shop

Testing (Materials Analysis) -- also known as Diagnostic and Testing Services

- Non-Destructive Testing
- Destructive Testing
- Surface Analysis

Group Two

- Adhesives
- Cleaning and Contamination Control (Surface Modification Processes)
- Encapsulation/Foams
- Explosives
- Isotope Separation
- Laser Detonators
- Tritium Processing
- Welding and Joining

Group Three

- Film Deposition, Surface Finishing, and Plating (Surface Modification Processes)
- Lasers
- Metal Hydrides
- Plastics
- Thermites

Since the University of Dayton study was published, additional work was done in assessing the commercial potential of the Mound technologies by Insight Partners and Lowell Haws, an independent consultant. Even as new technology applications are identified, a number of entrepreneurs have started businesses at the Mound, encouraging larger companies to utilize space and facilities at the Mound as well. These businesses and their matching respective technologies are discussed below within the context of an analysis of the commercial potential of the various Mound technologies.

The analysis uses the University of Dayton (U. of D.) study as a foundation and incorporates additional technology assessment work that was done, as well as on-site interviews with Mound business personnel. Throughout the analysis, Standard Industrial Classification (SIC) Codes were utilized to facilitate research into potential markets and technology related industries. Following this analysis is a summary chart that matches the SIC Codes used with their respective technologies.

The analysis begins with discussion of ceramics technology and then follows the order that the technologies were presented in the U. of D. study. Although the U. of D. study's attempt to group the technologies according to their commercial potential is valid (for example, all of group one technologies are being used by businesses already operating on the Mound), the order in which these technologies appear below should not be taken as an indication of their relative merit in relation to one another. The

analysis of each technology begins first with a description, then a discussion as to how this technology would be applied commercially, followed by a description of any businesses already operating on the Mound (these descriptions are highlighted) and finally, a general market summary that gives an indication of the economic strength (or weakness) of the industries that might use the aforementioned Mound technology.

Ceramics -- Mound facilities have the capacity to manufacture ceramic and glass-ceramic headers (during peak production, 24 different header configurations were produced and used as detonators, actuators, and igniters). The ceramic production facilities also have the capacity to produce glass to metal seals, high pressure seals, hermetic seals, electrical and fiber optic feed-throughs, metalizing and brazing, process development, and quality control of all facets of ceramic product processing.

The U. of D. study noted that the Mound's advantage in ceramics production occurs when where high quality and dependability are important, because the cost-per-part is high compared to standard commercial glass-to-metal seals. Quality requirements for most commercial operations are currently low and, therefore, costs are lower. The later assessment identifies some of the industries where these qualities would make a good match including: deep sea (extreme pressure) applications like oil wells, connectors and sensors for the chemical process industry (the ceramics and seals work well in a corrosive environment), and aircraft and space applications. Ceramics technology is also used in the manufacture of explosive components. The design and manufacture of these components was one of the Mound's major activities; EG&G Star City currently uses this technology in their manufacturing process (see below for more on the market potential of explosives).

The market outlook is generally favorable for the industries that might use ceramics technology. A 1994 *GRI Baseline Projection of U.S. Energy Supply and Demand* projected that the Oil & Gas Drilling Services industry's (SIC Code 1381) use of oil and gas drilling rigs would increase through the year 2010 and that annual growth would be 3.3%. The Chemical and Allied Products industry group (SIC Code 280) is also predicted to grow. A 1994 issue of *Chemical Marketing Report* calculated that annual growth in expenditures for new plant & equipment was 10% from 1993 to 1995. *GRI Baseline* predicted that production in this industry group would increase by 2.2% through the year 2010.

Finally, the Aircraft and Parts industry group (SIC Code 372) presents an excellent market opportunity -- the value of shipments exceeds $100 billion (according to *U.S. Industrial Outlook*, 1994) and over the past ten years consumption of advanced composites, of which ceramics are presumably a part, has increased by 7.6% annually (*Chemical and Engineering News*, August, 1993). However, SIC Code 3761 (Missiles and Spacecraft) is predicted to experience a short-term decrease in production according to the Bureau of Labor Statistics' *Monthly Labor Review*, November, 1993 -- so the conventional aircraft market might be more promising from a growth perspective.

Of course, both shipments of aircraft and missiles and spacecraft are calculated in terms of billions of dollars, so any need for the Mound's technology could be an excellent market opportunity. Likewise, the chemical and allied products industry group is a multi-billion-dollar market force. Companies like Union-Carbide, in Cleveland, should be queried as to their need for the Mound's ceramics products (as well as other 'chemical' products -- see below for more). Also of note, the U.S. chemical industry has been decreasing their R&D spending and now lags behind eight other research-based industries (*Chemical Week*, August 2, 1995). This situation presents an opportunity for the Mound to capitalize on their technology and state-of-the-art equipment to be used as research facilities for the larger chemical companies.

Flexible Circuits -- Facilities at the Mound are also capable of development and production of flexible circuits and flexible circuit production processes. Flexible circuits have advantages over traditional circuit boards because they are lightweight and can be twisted and bent into almost any shape. The printed circuit board industry (SIC Code 3679) is a $6-8 billion industry according to the *U.S. Industrial Outlook*, 1994, and is taking a greater interest in flexible circuits. Flexible circuits are used in a wide variety of military and consumer products (mostly electronic) including computer disc drives, cameras, membrane switches for appliances, and even skis.

Currently, Mound Flexible Circuits Corporation is manufacturing flexible circuits in 21,000 square feet of space. They will grow to over 100 employees by the end of the year and are looking for additional space right now. Within a couple of years the company hopes to be doing over $24 million in sales. According to the President of Mound Flexible Circuits, the flexible circuit industry is a $1.9 billion industry world wide; about $550 million of that is located in the U.S.

In general, the electronic component industry (SIC Code 3670) is expected to grow substantially over the next 5-6 years; sales are expected to exceed $100 billion by the year 2002 (from their 1992 level of $40 billion) and grow 10% annually (*Electronic Buyer's News*, 1993). The electronic component industry includes everything from semiconductors to liquid crystal displays; just about every 'end product' that uses electronic components (from computers to electronic appliances) incorporates some form of circuit, and the demand for these products shows no signs of losing momentum. The *Monthly Labor Review* predicts that short-term growth in the production of Computers and Auxiliary Equipment (SIC Code 3573) will be 8.1% a year and shipments of floppy disk drives alone are predicted to grow at an annual rate of 6.0% according to *Appliance*, 1995.

Sales of Consumer Electronics (SIC Code 3650), which includes audio and TV equipment as well as computers, are also expected to increase (approximately 6.9% annual growth) and by the year 2000, should reach $300 billion, according to *Office Equipment*, January, 1994. Finally, Automotive Electronics (SIC Code 3694) present another market opportunity for flexible circuits. Annual growth is expected to be

7.6% next year and production will be close to $13 billion (*Hendersen Electronic Market Forecast*, 1995).

Machine Shop -- Mound facilities have specialized capabilities with machining, thread milling, and cutter grinding, experience with design and prototype development, an ability to work with hard materials (especially glass-ceramics), and a well-equipped inspection department. Most of the machining was done on small parts, although many machines can be used for parts up to 3 feet in size. Mound machine shops are typically engaged in manufacturing, on a job or order basis, producing special tools and fixtures for use with machine tools, hammers, die-casting machines, and presses. Machine shops do work for a variety of customers with the defense and auto industries being their primary market. In fact, machining for glass and ceramics is used by EG&G Star City in their explosives manufacturing process, which one of the many examples of synergy between Mound technologies and businesses.

There are two machining businesses on the Mound. The larger company, Thaler Machine Company, occupies approximately 30,000 SF. in a new building on the outer rim of the Mound Facility (Building 105). They employ about 100 people and were an existing business in the Dayton area that moved onto the Mound to take advantage of the good equipment and favorable lease rates. The smaller company, Mound Manufacturing Center, has 18 full-time equivalent employees and is a Mound start-up business. The business recently moved into Building 28 and operates with a lease for the space and equipment (at some point they would like to own the equipment). Mound Manufacturing's clients include the government (defense contracts), the auto industry (GM, Toyota, smaller suppliers, etc.), the food industry, the canning industry (Alcoa), medical clients, even some prototype work for universities.

From a competitive perspective, there are a large number of machine shops in the Dayton area. In fact, it is the largest manufacturing industry (SIC Code 3500 -- Industrial Machinery and Equipment) in Southwestern Ohio, accounting for 23% of all manufacturing, according to the NIST Miami Valley Manufacturing Extension Center "Operating Plan", 1995. However, the Mound's capabilities in specialty machining and high precision may result in a cost of production that is too high for many customers, except in high value-added applications. This could work in the Mound's favor if the demand for high value-added applications increases.

As of 1992, there were close to 13,000 people employed in the Transportation Equipment industry group (SIC Code 3700) in Montgomery County alone, which generates a great deal of machining demand. The auto industry in the State of Ohio and the Dayton area tends to be cyclical, expanding and contracting along with the U.S. economy as a whole. Both Ohio's Gross State Product and the number of motor vehicle industry establishments have followed this pattern (data taken from the Ohio Department of Development's Office of Strategic Development, 1994).

In addition, projected U.S. employment in the Transportation Equipment group is expected to be approximately 1.6 million by the year 2005 -- down from approximately 2.1 million in 1992, a decrease of over 20% (*Monthly Labor Review*, November 1993). Whether or not this decrease will precipitate a similar decline in machining demand is uncertain. In some cases, auto industry employment decreases because the bigger firms outsource functions like machining, which will help smaller job shops like the ones at the Mound. In other cases, the decrease is related to competition from abroad and declining product demand; in these situations there is an overall contraction that will negatively impact the demand for machining. Also, the rate of productivity improvement in manufacturing sectors has constrained manufacturing employment growth, since fewer workers are now necessary to produce a given quantity of product, compared to previous years.

Non-Destructive Testing (NDT) -- according to the U. of D., study there are six areas of NDT in which the Mound has some expertise: radiography (RT), penetrant testing (PT), leak testing (LT), eddy current testing (ET), ultrasonic testing (UT), and magnetic particle testing (MP). The Mound may have some unique NDT experience with respect to tests in the metal matrix composite and ceramic areas. It has state-of-the-art equipment in three areas: RT, LT, and UT. These non-destructive testing capabilities, along with the destructive testing and surface analysis capabilities (discussed below) fit into a category referred to as "**Diagnostic and Testing Services**". Categorizing these capabilities as a whole is more instructive because the testing and materials analysis capabilities and the technologists who have started businesses using these capabilities can perform a wide variety of problem-solving services for government agencies and small to medium-sized companies. The *synergy* that these service-oriented technologies provide when coupled with the product or process technologies is a good one. Already these diagnostic and testing services businesses are providing support services to other Mound businesses involved in manufacturing.

However, according to the U. of D. study, the NDT market is stagnant or growing slowly. In addition, there is probably an increased supply of captive NDT labs and personnel to be entering the commercial market because the DOD was a major customer for NDT work. Another company hired by the MMCIC, Intell Advantage, Inc., used the Research and Testing Services SIC Codes (8731-8734) to identify companies that might be interested in working with (by marketing Mound capabilities) or at the Mound. This report simply identified companies (by category, i.e. metallurgy, environmental, etc.). The report did not attempt to assess the market for testing services. Montgomery County has 49 companies with SIC Codes 8731-8734, employing over 1,000 people. These companies (and any others in the Dayton MSA), if they were not identified by Intell, might be interested in utilizing the Mound's facilities. There is one company at the Mound involved in non-destructive testing. Mound Metrology performs NIST traceable calibration services, which involves testing and measurement of dimensional, mass, temperature, electrical, and physical standards.

Destructive Testing -- the U. of D. study notes that the Mound has a variety of capabilities in this area, including: the Explosive Component Test Facility (ECTF), the Mechanical Test Facility, the Metallurgical Laboratory and the Electron Optics Laboratory. The ECTF has three large explosive high speed camera test cells (rated at 10 lb. of TNT each). It constitutes a state of the art explosive facility that could have significant advantages over other government facilities in bidding for particular government work involving shaped warhead charges testing. The facility also might be able to attract work from companies that currently conduct their explosive tests in an outdoor environment. The later technology assessment identifies this facility (Building 87) as a capability that is in search of an entrepreneur or business investor.

The Mechanical Test Facility includes two servo-hydraulic test systems, two electro-mechanical test systems, and a -75 to 250 degree Centigrade environmental chamber that can be used on any of the test systems. The Metallurgical Lab has an automatic polisher and two metallographs and the Electron Optics Lab has five scanning electron microscopes. According to the U. of D. study, this facility and these labs are not equipped for high volume testing and therefore are unable to compete with established testing labs. However, there is potential use for equipment as part of a larger test or research capability and the servo-hydraulic test system could be used for impact work testing component panels to protect cockpits or advanced automotive uses.

A variety of smaller destructive testing businesses have already been created at the Mound, including one that uses the mechanical test facility. That business is called Envirospect, and it does vibration, shock, and spin testing primarily for the auto industry. Other destructive testing businesses include MCK Analytical which employs approximately eight full-time equivalents and does chemical analysis work (e.g., peanut butter analysis for Proctor and Gamble); Kinetica which does thermal analysis work; Mound Metallurgical, Inc. and MEAG; both companies do physical metallurgy work. Again, it is important to emphasize that these companies do more than testing -- they are like technology consultants and can help manufacturers solve problems.

Surface Analysis -- Mound facilities in this area include six large systems with multiple capabilities, which comprise the Mound surface lab: auger electron spectroscopy, x-ray photoelectron spectroscopy, energy dispersive x-ray spectroscopy, ion scattering spectroscopy, secondary ion mass spectroscopy, and fast atom bombardment. According to the U. of D. study, this is the best equipped surface lab in the State of Ohio. The equipment provides the capability to resolve almost any surface analysis dilemma that a commercial customer might bring. However, due to the slowdown in defense related spending there may be many captive labs in large companies that are looking for outside work, all providing competition for the Mound.

The National Discovery Center is a Mound company involved in surface analysis. Again, this company is more than a testing lab. As their own promotional literature states: "Our team of aggressive scientists, engineers, and production specialists are

dedicated to the quick resolution of your material problem, from R&D through production."

The work that Intell Advantage did in identifying other analytical labs applies here. They identified six companies throughout the U.S. that do surface and element testing (all SIC Code 8734). There are eleven "8734" companies in Montgomery County and again, if not identified by Intell, should be contacted as part of any marketing effort. The later technology assessment calls these capabilities "surface science" and as mentioned above, groups them into the category **Diagnostic and Testing Services**.

Adhesives -- the U. of D. study noted that the Mound was able to provide a selection of adhesives to accomplish joining and sealing tasks for a wide variety of materials and uses. Processing operations at the Mound utilized both hand mixing and automated dispensing equipment for liquid systems and laminating presses for film adhesives. Optimal bonds were achieved through surface preparation technologies (e.g. plasma processing) used to clean substrates or for surface modification. Unfortunately, this adhesives group no longer exists on the Mound, although the technology consultant involved in the later assessment believes that some of the Mound's surface modification technologies (see "Cleaning" and "Film Deposition" below) have market applications that would interest the adhesive industry.

The adhesives market is large and is expanding. Sales of Adhesives and Sealants (SIC Code 2891) are expected to grow at an annual rate of 38.5% and by 1998 should exceed $10 billion (*Chemical Week*, January 1995). In addition, the market information on Chemical and Allied Products discussed above (see Ceramics) applies here as Adhesives and Sealants is just a subgroup of major SIC Code group 280. Adhesives are used extensively in the Appliance Industry. The January, 1996 issue of *Appliance* includes a purchasing directory that lists a variety of firms that manufacture adhesives. This same issue predicts modest growth in the production of appliances for 1996 (low single digit percentage increases). However, international exports are experiencing greater growth and companies like Whirlpool believe that export growth to Brazil and Asia will be between 6-8% for the next couple of years.

Cleaning and Contamination Control -- The Mound has capabilities in five cleaning and contamination control technologies: semi-aqueous, dry gas plasma, super critical carbon dioxide, laser ablation cleaning, and high pressure aqueous spray cleaning. Super critical carbon dioxide is capable of being used as a substitute for CFCs in the removal of particles and organic contaminants introduced in the manufacture of circuit boards, optical equipment, and aerospace hardware.

The later technology assessment grouped these capabilities with the **Film Deposition, Surface Finishing, Plating** (see below) capabilities into a category called **Surface Modification Processes**. This category is descriptive of all of these technologies and recognizes that the technologies are processes used in the manufacturing of some product.

The U. of D. study says that the Mound has the capability to advise other production facilities in the establishment of cleaning techniques that are environmentally benign and that the Los Alamos National Laboratory is also competing in this market (they currently consult for Hughes). It is estimated super critical carbon dioxide fluid cleaning techniques could replace CFCs in 1/3 of their current applications. The later technology assessment indicates that the adhesives industry might be interested in these technologies -- survey work will be able to determine if, and at what level, this interest exists.

Encapsulation/Foams -- The Mound has done considerable work in the development of nonhazardous encapsulants and foams for its components. The Mound utilizes epoxy, polyurethane, and silicone encapsulants in manufacturing components -- however, the bulk of this technology is no longer available at the Mound. The Mound also has considerable experience in the generation and application of polymeric foamed products made by three techniques: gas blown, syntactic, and removable pore former and has been making low density carbon, or carbon foam, for years.

At one point, the Mound was funded by the U.S. Automobile Battery Consortium to develop carbon foam as a material for batteries for use in electric autos. While the Mound has expertise in developing very low density carbon foam, the overall battery expertise resides at Sandia Lab, to which the Mound was a subcontractor for the Battery Consortium project -- Sandia is currently pursuing this project on its own.

The additional technology assessment identified other possible battery applications including the use of foam for capacitors and fuel cells which are used in electronic appliances and consumer goods. This technology is still being developed and is not ready to go to market; however, this may present a good opportunity for the Mound to partner with a large electronics firm or battery manufacturer that would be interested in carbon foam 'battery' products. The company involved with specialty carbons and battery materials is called Inorganic Specialists and is currently a one-person shop. Research contracts with Wright Patterson Air Force Base form the company's revenue base, but the possibility exists that it might eventually form a partnership with or begin selling to electronic products manufacturers.

Explosives -- Complete capabilities exist at the Mound for development, manufacture, and testing of high explosive and pyrotechnic devices. Process technologies used in the development and production of explosive materials with the desired purity, particle size, composition, and flow characteristics include recrystallization, microencapsulation, and microcoating. The Mound also has considerable expertise producing pyrotechnic materials, including hot gas producers and low gas producing flammable solids such as thermites. Pyrotechnic process technologies include formulation, blending, and plasma deposition of thermites. Production of electro-explosive components includes the use of a foamed in-place polyurethane to encapsulate the unit.

The Mound company known as EG&G Star City, Inc. uses this explosive technology to manufacture ordnance devices. Currently, the company has 13 full-time employees and about the same number of part-timers. Despite the downturn in the defense industry, this company believes they have serious growth potential given the unique nature and high quality of their product. One of Star City's customers is Lockheed/Martin (which purchases detonators and other energetic devices). There is enormous growth potential with just this customer, roughly $2-3 billion over the next 15 to 20 years. Star City is also working on a CRADA (Cooperative Research and Development Agreement) with the Navy that is worth about $12 million now, but could lead to sales of Star City product to the Navy for years to come. In addition to defense, other potential applications for Star City detonators include the automobile industry (for airbags), space applications, mining industries, and highway construction.

Multiple technologies are used in detonator manufacturing (in addition to the processing of explosive powder); these technologies are also mentioned below. The Mound excelled at the development, manufacturing, and testing of explosives (also known as energetic devices). Expenditures by the DOD on Ordnance and Accessories (SIC Code 3480) were over $1.5 billion in fiscal year 1995 (*Henderson Electronic Market Forecast*, 1994). There is great potential here for the Mound to grow.

Isotope Separation -- The Mound is a world leader in thermal diffusion techniques for the separation of the noble gases (a noble gas, like helium, is rare and when mined must be purified through the separation technique before it can be used commercially). It also has thermal diffusion capability for producing other isotopes including Chlorine 12, 13, Bromine 79, 81 and Sulfur 34, 36.

At the time of the U. of D. study, there was an oversupply of noble gas isotopes in world markets and the fate of the entire DOE isotope separation program was unknown. DOE hired Arthur Andersen to study the feasibility of privatizing this program. Their study concluded that privatization was indeed feasible and the DOE might achieve cost savings by putting the production of these isotopes in private hands. There is currently a group of technicians that have started a company and are negotiating with the DOE to provide them with noble gas isotopes using Mound equipment.

The later technology assessment identifies neutron detectors, medical isotopes, particle accelerators, and gas tagging as potential market applications. All are niche markets and primarily involve research and development. For example, the medical industry can use isotopes for cancer research. Nevertheless, this technology does represent a market opportunity and once the DOE makes a final decision regarding their involvement in isotope production, there is the possibility that the Mound will continue to support this 'industry'.

Laser Detonators -- the Mound has considerable expertise and experience in the laser ignition of energetic materials either directly or through an optical fiber. The Mound

also has the capability to construct and destructively test such optically initiated components. According to the U. of D. study, other organizations, including Los Alamos and Lawrence Livermore National Laboratories, seem to be farther along in developing applications for laser detonated devices.

As mentioned above, EG&G Star City produces explosive powder and the laser detonators that use the powder. The lasers actually ignite the powder to achieve the desired result -- a detonation. The laser technology constitutes its own group (see below) and has other commercial applications beyond the detonators.

Tritium Processing -- Facility engineers at the Mound have expertise in the design of total integrated systems for processing and handling of radioactive materials and components. The Mound has developed a range of technologies to safely process large quantities of tritium with virtually no release to the environment. Mound's personnel and expertise in tritium facility design have been used by many DOE locations. Although the technology assessment identifies commercial applications for tritium, the tritium processing technology will not remain at the Mound and clean-up efforts are underway to ensure that no radioactive contamination exists for future Mound users and tenants.

Welding/Joining -- The Mound has developed a number of methods for joining a wide variety of metals and has utilized a number of joining processes including: Laser Welding, Electron Beam Welding, Resistance Welding, Diffusion Bonding, Ultrasonic Welding, Thermosonic Welding, Gas Tungsten Arc Welding, Pinch Welding, Forge Welding, Brazing, and Soldering. The Mound has a very good reputation among DOE labs for their ability to solve complex joining problems.

The Mound has the potential to develop a stand-alone welding shop if there was a market niche that needed some combination of Mound's unique capabilities such as extremely accurate welds, high quality welds, micro-welding, complex or intricate welding problems, etc. Another possibility is that the Mound could act as consultants or as a training facility for production people or producers of welding equipment. This opinion is shared by both the U. of D. study and the later technology assessment.

Film Deposition, Surface Finishing, and Plating -- Plating capabilities include electrodeposition of cadmium, chrome, copper, gold, nickel, and silver on selected surfaces. Surface finishing capabilities include anodizing and dyeing, black oxidizing, brush plating, chromating, electroless nickel plating, electropolishing, and passivating. The Mound also has a variety of cleaning and etching processes. Film deposition capabilities provide a wide variety of deposited and etched film configurations encompassing the preparation of both metallic and nonmetallic films using sophisticate physical and chemical deposition technologies.

Previously, this Mound technology was used to support other Mound activities. Whether or not it could be commercialized as a stand alone capability has yet to be determined. Recall that the later technology assessment groups these capabilities with

the cleaning and contamination control capabilities into one category known as **Surface Modification Processes**. One possible application that is mentioned is the microcircuit industry, which could use many of the technologies in a 'clean room' environment. This industry is large and is growing -- sales of products like semiconductors are currently in the $25-$30 billion range and are projected to grow to $73 billion by the year 2002 (annual growth of 11.5% -- *Electronic Buyer's News*, May 1993).

Lasers -- personnel have considerable experience with a wide variety of laser related activities including laser welding, laser detonation, laser-induced fluorescence spectroscopy, and the development of prototype laser machines. Most of these capabilities have already been discussed. This technology gives the Mound the ability to use their skills in a consulting capacity as well as in the design and production of prototype equipment.

The Mound Laser & Photonics Center, Inc. does this type of consulting with laser technology as well as photonics (which is basically anything to do with light). The Center has 4 full-time employees and 3 part-time. Their clients include companies that are involved in materials processing, welding and drilling, etc. One client is tapping the Center's expertise with photonics for a high-speed photography application. The Center is also interested in laser education and in promoting lasers as a technology that is underutilized.

Metal Hydrides -- the U. of D. study notes that the Mound has extensive experience in the preparation, storage, and handling of a large number of metal hydrides. This expertise was developed in conjunction with the tritium work because the easiest way to store and transport tritium is in the form of a hydride. The Mound has good equipment available for the handling and storage of various metal hydrides. The eventual commercial utilization of metal hydrides is uncertain. More information is needed on the level of technology for hydrogen transportation and the possibility of developing hydride batteries.

The later technology assessment notes that there is the potential for hydrides to be used as an alternative to gasoline as a fuel for automobiles. Titanium hydrides are used as fuel for certain pyrotechnics which have desirable qualities for use in automobile airbag systems and may have other, as yet undiscovered, market applications. Recently, the DOD through the Small Business Innovative Research (SBIR) program, solicited proposals to work with the DOD in developing titanium hydrides into a diesel fuel source. There is one company at the Mound that manufactures metal hydrides known as Wheatville Technology, Inc. This company is currently exploring some of the commercial applications mentioned above for titanium hydride, although they currently manufacture very little product.

Plastics -- The Mound has the technology for material selection, formulation, molding, and extrusion of thermosetting/thermoplastic and composite compounds. Capabilities include injection molding at high temperature, compression molding, thermoforming, and composite fabrication. These capabilities have been used to

produce parts for detonators, actuators, igniters, torches, switches, and timers. The U. of D. study reports that the amount of equipment and capacity is limited. The plastics work has primarily served as a support to Mound production activities, as a result, it does not appear to be an area where there is sufficient capacity or a unique capability to hold great promise for an independent enterprise. This opinion was shared by the later technology assessment.

However, like adhesives, plastics are used extensively in the appliance industry (SIC Code 363 -- Household Appliances). By 1997 it is estimated that the manufacture of household appliances will consume over 1.4 billion pounds of plastic materials (*Appliance Manufacturer*, August 1993) and short term annual growth in use of these materials is estimated at 3.5% (*Chemical Marketing Report*, 1993). In addition, coupled with the laser technology at the Mound there is currently an effort underway for the Mound to become part of a research team working on rapid prototyping, which is a technique for producing plastic moldings of parts that can be quickly altered for design changes. These parts could be used for just about any type of machining, the most obvious being the auto industry.

Thermites -- the Mound has developed the ability to compress thermite materials (composed of a metal oxide and a reactive metal powder) into various shapes and sizes. Thermite materials can be used as torches or where there is no alternative heat source, such as electricity or petroleum fuel. The U. of D. study concludes that "thermite appears to be a technology looking for a problem. There are ideas and speculation about possible uses, but currently not a substantial market." The later technology assessment identifies potential applications that include the chemical process industry, metal joining, and destruct/disablement applications. Currently, EG&G Star City uses thermite technology for some of their energetic devices.

Radio-Isotopic Thermal Electric Generator -- also known as RTG. RTGs were developed by the Mound. They use an encapsulated radioactive material to generate electrical power. Currently, NASA uses RTGs for deep space satellites -- there is also the potential that they might be used in other types of space transport. NASA remains the sole customer for RTGs and they will continue to be manufactured by the Department of Energy at the Mound.

Conclusions -- Many of the Mound technologies have commercial applications that are a part of growing industries. There are already almost twenty businesses that have started up on or moved to the Mound. A couple of these businesses are already doing over $1 million in sales. Star City and Mound Flexible Circuits, in particular, are poised for strong growth in the next five years. By year end the two businesses could have close to 150 employees. If the Mound were to acquire 2-3 businesses like Star City or Mound Flexible Circuits per year, there would be around 2,000 employees working at the Mound in ten years.

However, these companies are bigger than the average company currently operating on the Mound. Most of the Mound companies have anywhere between 5-20 employees, with the average number of employees closer to 15. If we assume that

these Mound companies will grow, and that the Mound can continue to attract companies with 20-30 employees, then we can develop a variety of ten year growth scenarios for total Mound employment. The below table creates nine different employment scenarios based on the ability of the Mound to attract 2-3 companies a year with an average of 20-30 employees. These estimates are probably conservative -- if one or two companies are attracted to the Mound every couple of years, like Thaler Machine Shop (with over 100 employees); or, if an existing company experiences explosive growth, then the estimates would increase dramatically.

Table 11: Ten Year Growth Estimates for Mound Employment

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
20 employees										
2 businesses	40	80	120	160	200	240	280	320	360	400
2.5 businesses	50	100	150	200	250	300	350	400	450	500
3 businesses	60	120	180	240	300	360	420	480	540	600
25 employees										
2 businesses	50	100	150	200	250	300	350	400	450	500
2.5 businesses	63	126	189	252	315	378	441	504	567	630
3 businesses	75	150	225	300	375	450	525	600	675	750
30 employees										
2 businesses	60	120	180	240	300	360	420	480	540	600
2.5 businesses	75	150	225	300	375	450	525	600	675	750
3 businesses	90	180	270	360	450	540	630	720	810	900

Whether certain Mound technologies, like the surface modification technologies, can be fully exploited remains to be seen. As discussed above, there are many potential applications for these technologies. For example, the surface modification technologies have applications in the adhesives or electronics industries, both of which are experiencing strong growth. The question remains as to whether or not the Mound will be able to attract investors or entrepreneurs willing to turn these technologies into successful businesses. If it is possible, the City of Miamisburg stands to gain a large group of employees in a diverse group of businesses.

TechnologyPotential Application/SIC Code
Market(and description)

CeramicsManufacture ceramic and 1381 (Oil and Gas
glass-ceramic headers -- processDrilling Services),
glass to metal seals -- used for280 (Chemicals and
extreme pressure applicationsAllied Products),
including oil and gas drilling,372 (Aircraft and

the chemical process industry,Parts), 376 (Missiles,
and aircraft & space applicationsSpace Vehicles, and
Parts)
Flexible CircuitsReel-to-reel process -- used in 367 (Electronic
various military & consumerComponents),
products including: cameras,368 (Photographic
computers, membrane switches, Equipment and
and deep hole drilling cableSupplies), 3573
(Computers and
Auxiliary Equip.)

Machine ShopSmall, high precision parts;3544 (Specialties,
ability to work with hard tools, jigs and
materials (glass-ceramics);fixtures), 3545
specialty machining in thread(Machine tool
milling and cutter grindingaccessories), 3599
(Industrial Machinery,
n.e.c.)

Testing & MaterialsBoth Non-Destructive and 873 (Research and
AnalysisDestructive Testing --testing services)
surface analysis lab is very well
equipped -- problem-solving
services for government agencies
and small to medium sized
companies

AdhesivesTechnology group no longerN.A. (see below)
exists at the Mound -- surface
modification processes might
have market applications that
would interest the adhesives
industry

TechnologyPotential Application/SIC Code
Market(and description)

Cleaning andPart of what the later2891 (Adhesives and
Contamination technology assessment Sealants), 3674
Controlrefers to as Surface(Semiconductors and
Modification Processes -- Related Devices)
super critical carbon dioxide
fluid is capable of being
used as a substitute for CFCs
in the removal of particles
and organic compounds

Encapsulation/Advanced batteries, fuel cells,363 (Household
Foamsfilters, capacitors -- produceAppliances), 3692
high purity, low density foamsPrimary Batteries

(was funded by the U.S.
Automobile Battery
Consortium)

ExplosivesThis is one of the Mound's3489 (Ordnance and
main expertise -- also knownaccessories, n.e.c.),
as the energetic materials2892 (Explosives)
technology group -- used
with other technologies to
manufacture detonators

Isotope SeparationWorld leader in thermal ???? (not sure)
diffusion process for noble
gas isotopes -- used for
neutron detectors, medical
isotopes, particle
accelerators, gas tagging

Laser DetonatorsMilitary, mining industries,3489 (Ordnance
highway construction, auto-and accessories,
mobile air bags -- expertisen.e.c.)
in the laser ignition of
energetic materials through
an optical fiber

Tritium ProcessingTritium lamps, glow-in-theN.A.
dark fabric -- will not remain
at the Mound

Welding/JoiningNiche market or training -- 344 (Fabricated
the Mound can solve complexstructural metal
joining problems and hasproducts), 349
utilized a number of joining(Misc. fabricated
processesmetal products)

Film Deposition,Microcircuit industry --3471 (Plating and
Surface Finishing,physical and chemicalpolishing), 3479
Platingdeposition technologies(Metal coating and
allied services), 3674
(Semiconductors
and Related Devices)

LasersDiversity of laser873 (Research and
equipment and lasertesting services),
related activities --3699 (Electrical
commercial applicationsMachinery, Equip-
mostly related to otherment, and Supplies,
capabilitiesn.e.c.)

Technology	Potential Application/Market(and description)	SIC Code
Metal Hydrides	Solid storage of hydrogen; pyrotechnic fuel -- used to store and transport tritium	286 (Industrial organic chemicals), 289 (Misc. chemical products)
Plastics	Capabilities include injection molding at high temperature, compression molding, thermoforming, and composite fabrication	282 (Plastics materials and synthetics), 3089 (Plastics products, n.e.c.), 363 (Household Appliances)
Thermites	Destruct/disablement applications; metal joining; one-time chemical heat source; synthesis of specialty ceramics	???? (not sure)

[1] The New York Times, 1996.
[2] Luger & Goldstein, Technology in the Garden: Research Parks and Regional Economic Development. University of North Carolina Press, 1991.
[3] Ibid.
[4] Center for Urban & Public Affairs, Wright State University
[5] Wall Street Journal, January 31, 1996, P1.
[6] Gentile Station Reuse Plan, March 1995, page 72.
[7] The Dayton Business News, May 20 1996, page 2.

Section 5 - Description of the Due Diligence End State Plan

As part of the planning team's due diligence analysis of the Mound, an end state plan was developed which depicted one possible scenario for reuse and development. The plan is based on the team's initial understanding the constraints to reuse of buildings and development of land. The following is a description of the Due Diligence End State Plan illustrated at the end of this section.

Road Improvements

The plan envisions limited changes to the vehicular circulation system on the site. The one area where significant chances have been planned is near the entrance on Mound Road. The present road configuration around the entrance is designed to provide a secure and separate points of entry for employees and visitors, plus unsecured entry to parking. Once the site is transferred over to non-government operations, it is expected that this need for a secure entry point will be discontinued providing an opportunity to create a more aesthetically pleasing entry at this point. A new road has also been shown along the sites western boundary near OSW that connects with the road passing through the Test Fire area. In addition to these new roads, the Due Diligence End State Plan envisions reconstruction of over 4 miles of roads on the site. Most of this roadway reconstruction will involve major pavement improvements with landscape improvement to the street edges.

Site Improvements

Two levels of landscape improvements are outlined in the End State Plan. These include developing formal landscaped areas near building entrances and at focal points on the site; establishing a natural landscape treatment on hillsides and secondary open spaces throughout the site. Establishing both the formal and natural landscape on the site will be essential elements in transforming the image of the site to a corporate research and manufacturing facility.

Additional site improvements identified in the End State Plan include developing additional drainage retention facilities. The expanded drainage retention facilities are needed to mitigate problems with the existing system and provide expanded detention capacity to accommodate additional run-off from new buildings and surface parking.

The plan also envisions creating approximately 8 acres of new surface parking lots. The new lots are necessary to both replace parking displaced by new buildings constructed on the Lower Area "A" parking lot and to locate parking closer to buildings scheduled for reuse.

Building Reuse and Removal

The End State Plan proposes reusing roughly 852,000 gross square feet of existing building space (252,000 gsf of office/administration and 600,000 gsf of laboratory/research/light industrial space). In addition, the plan envisions the removal of

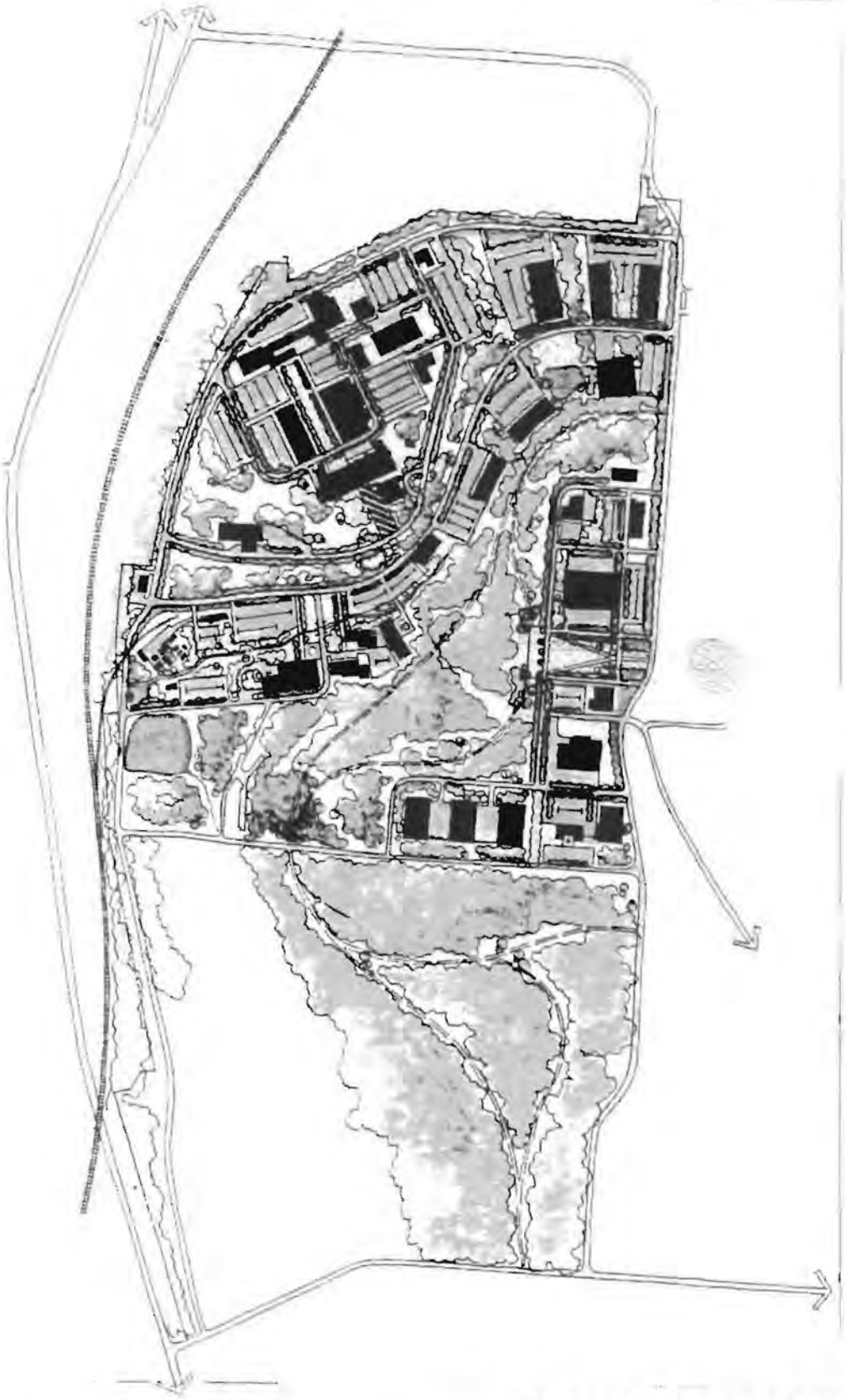
over 480,000 gross square feet of building space (300,000 of which is scheduled for removal by the DOE). The evaluation criteria used to identify buildings suitable for reuse included DOE's plans for disposition, the buildings existing condition, the level of contamination, the marketability of the building given its current use (i.e. manufacturing, explosive storage, research, office), and the location of the building on the site. In addition, the plan envisions developing over 1.0 million gross square feet of additional space on the site in the future. Over 85 percent of the additional development (849,000 gsf) is planned to occur on undeveloped land in three areas: the southern half of the site (South "40") will accommodate 575,000 gsf, the Lower Area "A" parking lot will accommodate 137,000 gsf, and undeveloped land in the SM-PP area will accommodate 137,000 gsf as well. The remaining 156,400 gsf of future development is envisioned to occur as infill on parcels created as buildings are removed.

Cost Projections

In conjunction with preparation of the Due Diligence End State Plan, order of magnitude cost projections were prepared for the major work elements outlined in the plan. A twenty five percent construction contingency has been added to account for unanticipated changes in both design and construction. An allowance equal to twenty five percent of the total construction cost and construction contingency has been included for indirect project costs such as professional fees, testing and project management.

Due Diligence Cost Projections

Cost Item	Size/Units	Unit Cost	Estimate
Roads (two lanes)			
• Road Improvements with Major Utility Lines	3,400 l.f.	$450/l.f.	$1,530,000
• Road Improvements with Streetscape Improvements and No Utilities	19,000 l.f.	$200/l.f.	$3,800,000
• Road Improvements with No Utilities and No Streetscape Improvements	3,400 l.f.	$100/l.f.	$340,000
		subtotal	$5,670,000
Site Improvements			
• Formal Landscaped Areas	6 acres ($8/sf)	$350,000/acre	$2,100,000
• Natural Area Landscape	77 Acres ($1/sf)	$43,000/acre	$3,311,000
• Drainage Retention Improvements	lump sum		$195,000
• New Parking Areas (on the Hill only)	8 acres	$150,000/acre	$1,200,000
		subtotal	$6,806,000
Facilities to be Demolished by MMCIC (not on DOE's List)	300,000 gsf	$3.50/gsf	$1,050,000
		subtotal	$1,050,000
Facilities to be Renovated for Reuse			
• Lab / R&D / Lt. Industrial Bldgs	530,900 gsf	$10.00/gsf	$5,300,000
• Office / Administrative Bldgs	252,000 gsf	$30.00/gsf	$7,560,000
• Separate HVAC Systems	782,900 gsf	$15.00/gsf	$11,743,500
		subtotal	$24,603,000
Total Construction Cost			$38,129,000
Design and Construction Contingency 25%			$9,532,000
		subtotal	$47,661,000
Indirect costs (soft costs) 25% of construction and contingencies including fees, testing, project management			$11,915,000
Total			$59,576,000



Miamisburg Mound Reuse Plan

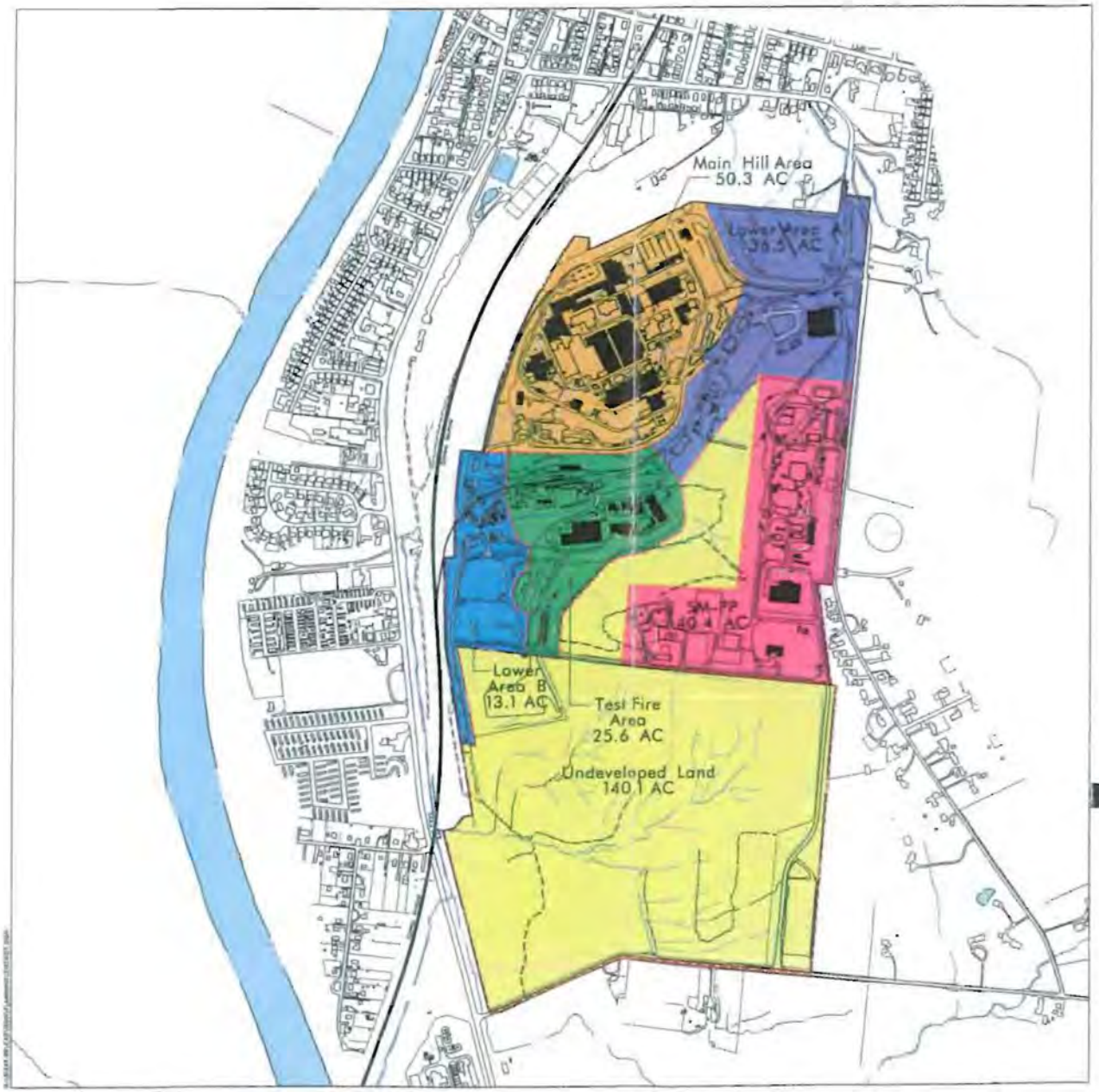
DUE DILIGENCE END STATE PLAN

Mound

EXISTING BUILDINGS REUSED

FUTURE BUILDINGS

PARKING



Site Districts

Legend

	Lower Area "A"	36.5 AC
	Main Hill Area	50.3 AC
	Test Fire Area	25.6 AC
	Lower Area "B"	13.1 AC
	SM-PP Area	40.4 AC
	Undeveloped Land	140.1 AC
	Total Site Area	306.0 AC

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

May 1996

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URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

0 375 750 1125

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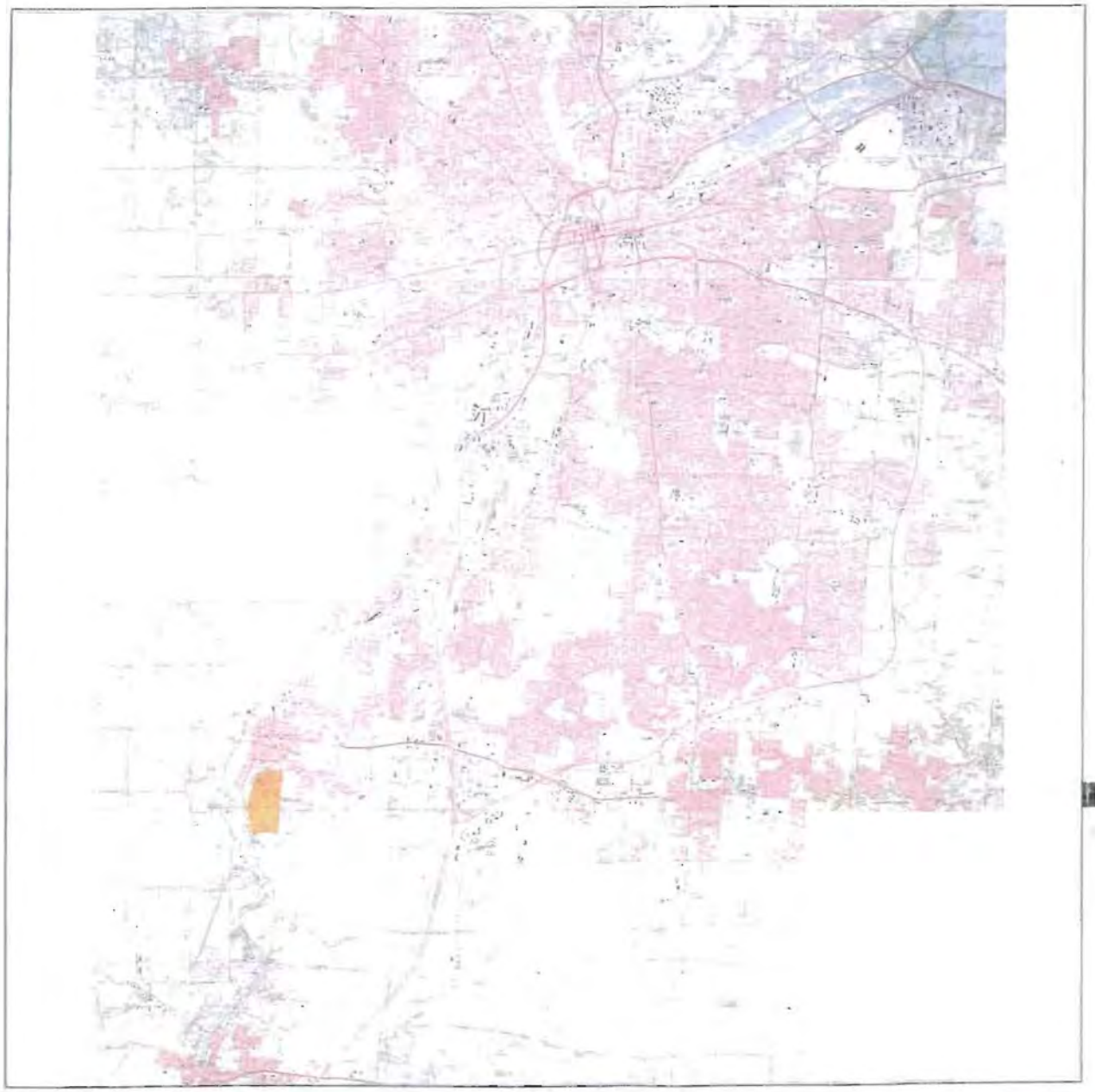

Regional Context

Legend

Miamisburg Mound Site

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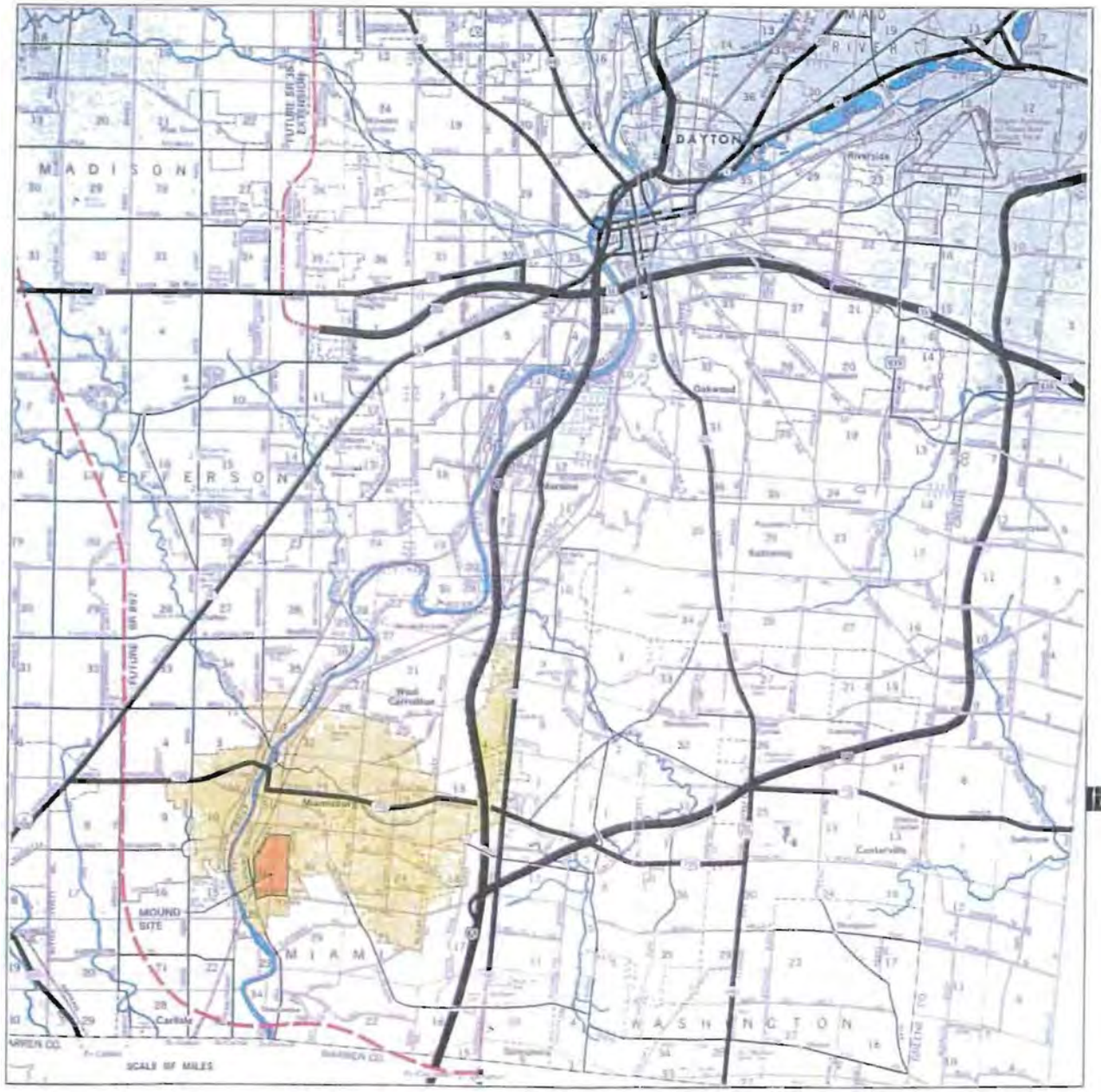
0 0.8 1.6 2.4 Miles

N



Transportation and Access

Legend

- Primary Road
- Secondary Road
- Tertiary Road
- Future Connector
- Miamisburg Mound Site

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0 .75 1.5 2.25 Miles

N

Physical Assets

3. Natural Resources

- 100 Year Flood Plain
- Deep Water Aquifer
- Minor Wetlands
- Vegetation

Natural Resources

Legend

- Surface Water / Wetlands
- Lawn / Old Fields
- Understory
- Trees
- Existing Mound Buildings
- Paved Surfaces
- Aquifer
- 100 Year Flood Plain
- Drainage Ways

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Physical Assets

4. Slopes

- Significant Steep Slope Constraint
  (**42%** of the site)

Slope Analysis

Legend

- 0–5% Slopes
- 5–10% Slopes
- 10–15% Slopes
- 15–20% Slopes

Exist. Mound Site / North Parcel				176 AC.
0–5%	=	62 AC.	35%	
5–10%	=	56 AC.	32%	
10–15%	=	18 AC.	10%	
15–20%	=	40 AC.	23%	
Exist. Mound Site / South Parcel				130 AC.
0–5%	=	33 AC.	25%	
5–10%	=	27 AC.	20%	
10–15%	=	21 AC.	17%	
15–20%	=	49 AC.	38%	
Site Total				306 AC.

Total Site@10–20% Slope = 89 AC. or 42%

0 375 750 1125

Soils Constraints

Legend

Soils Constraining New Development – 242 AC. [79%]

Soils Supporting New Development – 64 AC. [21%]

Site Total – 306 AC.

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Areas of Contamination

Legend

- Known Areas of Radiological Contamination
- Contaminated Pipeline
- Buildings with Radiological Contamination
- Buildings with Chemical Contamination
- Areas with Elevated Levels of Volitile Organic Compounds

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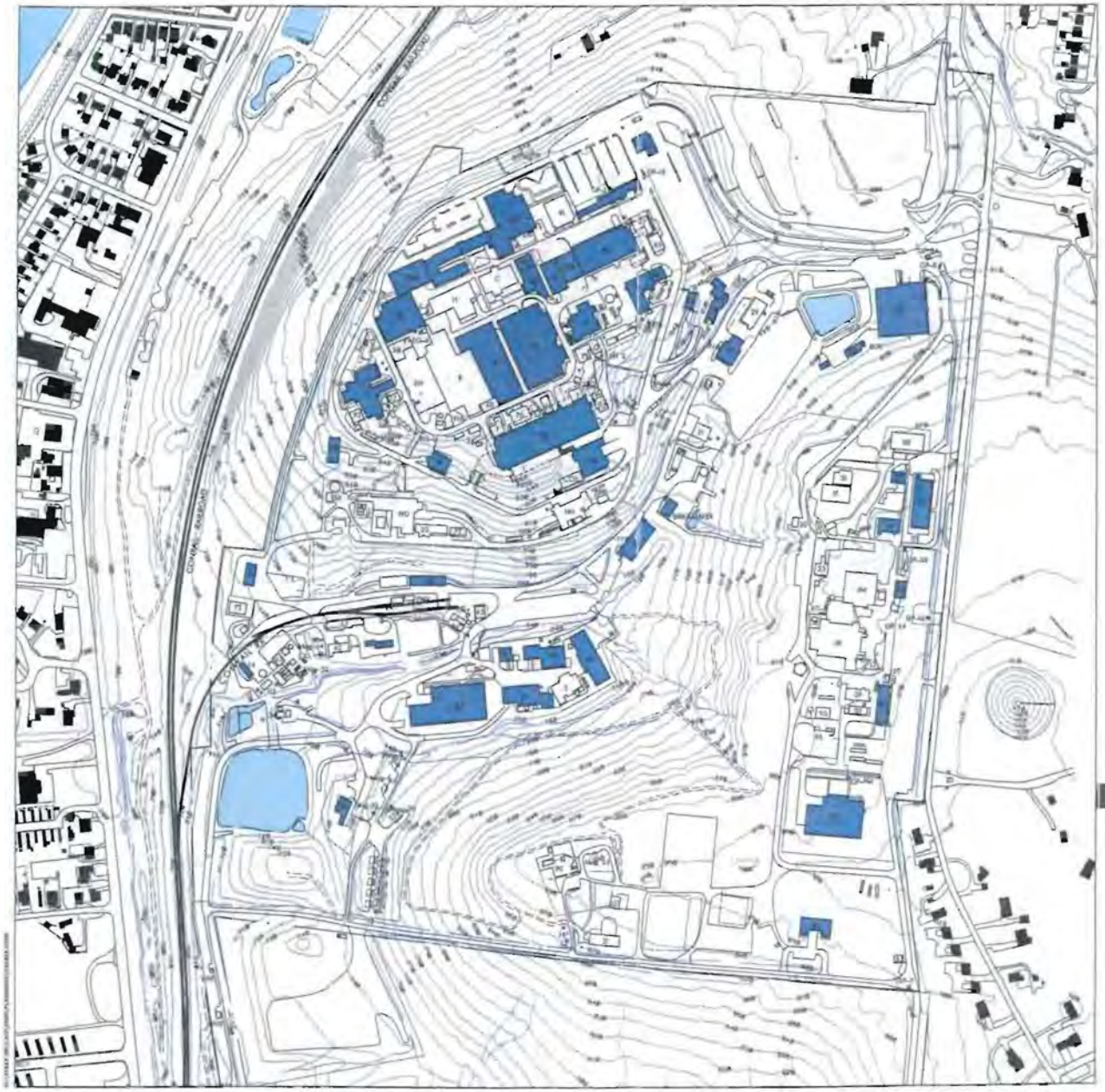
Physical Assets

7. Net Usable Land Area

- Developable Land Area = **159** Acres
  (**52%** of the site)
- Initial Focus on Parcels with Access



Building Reuse Potential

Legend

Buildings with Reuse Potential

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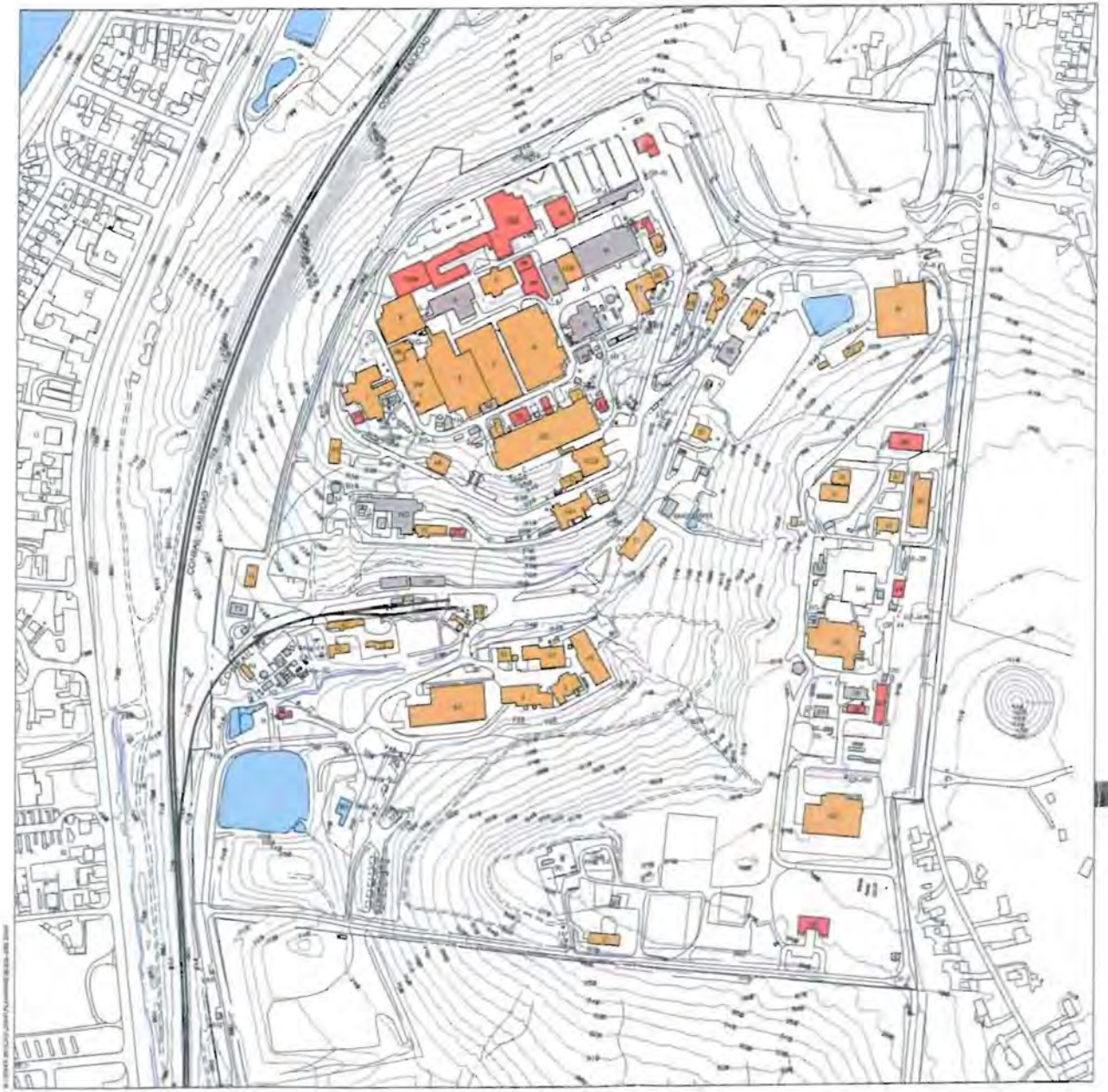
0 200 400 600

N



Existing Building Use

Legend

- Lab /R&D /Lt. Industrial
- Office /Administration
- Storage /Support/Service

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0 200 400 600

N

Net Usable Land Area

Legend

Developable Land – 135 Acres

Constraints:

Steep Slopes @ 10–20%

Wetlands

Wetland Setback [100']

100 Year Flood Plain

Aquifer

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Buildings with No Reuse Potential

Legend

Buildings with No Reuse Potential

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Above Ground Utilities

Electric Lines

Stanchion Lines

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Below Ground Utilities

Water

Sanitary Sewer

Storm Drainage

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Buildings Scheduled to be Removed by DOE

Legend

Buildings Scheduled to be Removed by DOE

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Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

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0 200 400 800

N

Building Information Summary: Option 1

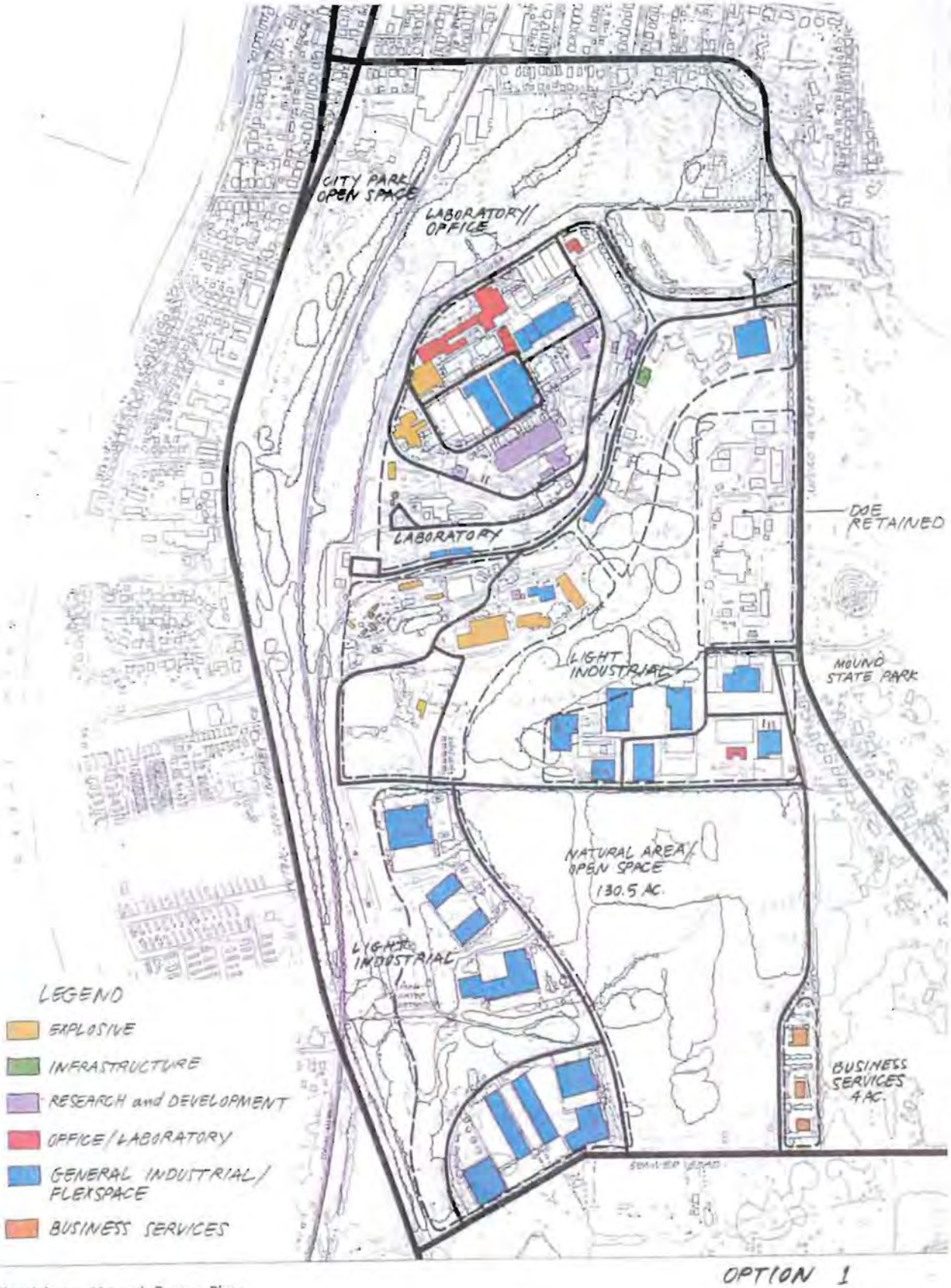
Gross floor area of existing buildings to be reused		**795,900**
Proposed uses		
Office	253,200	
General Industry	240,400	
Research and Development	150,300	
Explosive	139,400	
Infrastructure	12,600	
Note: 49,700 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		**540,300**
Buildings scheduled to be removed by DoE based on the ICP	235,500	
Buildings which have not been scheduled to be removed by DoE based on the ICP	83,300	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40	400,000 gsf			20,000 gsf		420,000 gsf*
SMPP	145,000 gsf					145,000 gsf*
Total	545,000 gsf			20,000 gsf		565,000 gsf*

*- space developed by someone other than MMCIC



OPTION 1

Miamisburg Mound Reuse Plan

Mound

July 1994

Reuse Option 2: Industrial and Technology Center

This option requires site investments and building improvements to attract high-value, diversified market and affect rapid-as-possible absorption of buildings and land. It assumes that some public/private developer/operator will stay involved indefinitely to manage the operation in the interest of job creation. This entity's non-profit status would enable the operator to continue receiving federal and state funding.

Market

- Marketing strategy focuses on attracting the greatest number of jobs, at the highest rates of pay, over the shortest time.

- Available space is marketed to below-market, start-up, technology business tenants. Emphasis is on firms dealing with technology-sensitive products, those providing diagnostic and analytical services and others that can take advantage of existing equipment while supporting and complementing existing capabilities. These businesses would be able to work within the physical characteristics of the site and be comfortable with the relatively poor visibility of and accessibility to the site.

- Undeveloped land is marketed to technology-based or light-industrial users with no specific effort to achieve affinity with existing start-up businesses on site.

- To increase its value, vacant land is marketed after it is demonstrated that existing mound facilities can be successfully transferred to the private sector.

Development Strategy

- Investments in infrastructure and amenities go beyond code compliance but only to the extent necessary to attract the desired market and the desired rate of absorption.
- A broad mix of R&D, flex space, light manufacturing and office users are sought to accelerate absorption of land and buildings and minimize the closure impact on the community.
- Amenities on the site are created, possibly including support retail, food service, banking, gas, dry cleaning, and recreation among others.
- MMCIC operates the site through the planning and transfer stages, setting up an administrative entity to provide for long term operation of the physical plant. Responsibilities are likely to include leasing; building, road and open-

space maintenance; central shipping and receiving for main development areas; and operation of the utility systems if public operation is not feasible.

- Undeveloped land is sold for development by others.

Physical

- Maximum reuse of existing roadways is emphasized with selected upgrading to achieve a more marketable standard.
- A common space is established, probably within an existing building, where clerical, duplication and other services as well as conference rooms can be provided to start-up businesses.
- Existing buildings are reused unless (a) demolition is necessary for parking; (b) the feasibility of finding a user is limited because the building is too specialized; or (c) the reconfiguration of the building for a potential user is not feasible.
- All retained buildings rely on their own heating and chiller systems except where connected buildings suggest the economy of a combined system.
- Water, sewer, electric and gas services to individual buildings are provided by outside operators.
- Investments are made in some limited amenity development around buildings including small open spaces, improved lighting, paving and landscaping.
- Existing open space is cleaned up on a limited basis to improve appearance.
- The stormwater management system, including retention areas, is expanded.
- Parking facilities are well located and improved with paving, lighting and limited landscaping.
- Raw land is sold or leased in bulk and Mound Avenue is extended to improve access to the raw land.

Operating and Management

- A public/private operator succeeds MMCIC and remains the key player in the ongoing management of Mound properties. Raw land can be sold, but the existing facilities--marketed below rate--would be leased with a primary goal of job creation. As a publicly supported body, the public/private successor to MMCIC can operate at no profit or be a conduit for federal and state funding while managing the asset to maximize job creation. A joint venture (for fee) may be a way of bringing management expertise to the project, but the "break even" goal will preclude a for-profit partner.

- All site amenities and services provided by the operator are evaluated on a cost/benefit basis and provided to MATC business at no less than cost.

Miamisburg Mound Reuse Plan

OPTION 2

Mound

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Building Information Summary: Option 2

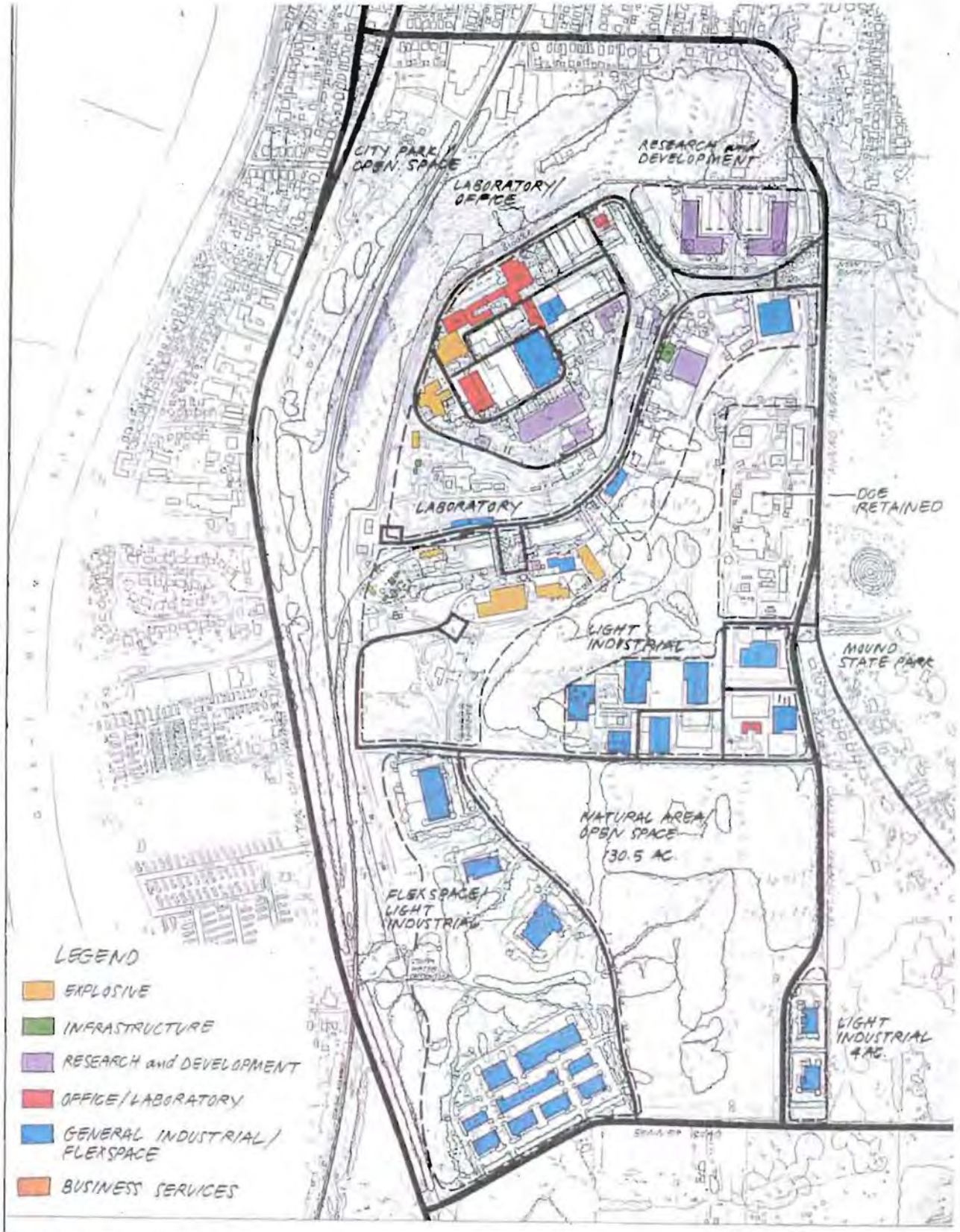
Gross floor area of existing buildings to be reused		**707,100**
Proposed uses		
Office	235,200	
General Industry	178,100	
Research and Development	150,300	
Explosive	130,900	
Infrastructure	12,600	
Note: 1,900 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		**629,100**
Buildings scheduled to be removed by DoE based on the ICP	283,300	
Buildings which have not been scheduled to be removed by DoE based on the ICP	124,300	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40	140,000 gsf	150,000 gsf				290,000 gsf*
SMPP	145,000 gsf					145,000 gsf*
Lower A			180,000 gsf			180,000 gsf*
Main Hill					100,000 gsf	100,000 gsf*
Total	**285,000 gsf**	**150,000 gsf**	**180,000 gsf**		**100,000 gsf**	**715,000 gsf***

*- space developed by someone other than MMCIC



Miamisburg Mound Reuse Plan

OPTION 2

Miamisburg Mound Community Information Center

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Reuse Option 3: Technology Center

This is the "high investment" option focused more exclusively on the technology market. Infrastructure and other improvements are made to bring the property to a level attractive to investors and the higher-value market segment. MMCIC could remain an operator or a partner with an investor/operator or could sell the property to an investor/operator.

Market

- Focus on highest paying jobs, potentially increasing the length of time over which space can be absorbed.
- The historically advanced technology character of the site is promoted and emphasis on the core technologies is continued.
- The effort is made to attract firms specializing in technology-based products, diagnostics and analytical services, complementing the existing capabilities of the site.
- On-site retail and commercial services are provided.
- The MATC seeks to be competitive with other projects of a similar market profile in the Dayton-Cincinnati area.

Development Strategy

- The development strategy is long term.
- The strategy is focused on a high-value market segment that supports regional economic development efforts.
- Mound is developed as an "investment grade" property.
- The image of an advanced technology center is created by modifying, improving or replacing facilities and infrastructure through long term investment.
- MMCIC continues to operate the center until it reaches an agreement with DOE that satisfactorily provides for the transfer of an asset which is financially sound and competitive in the technology market. At that point, MMCIC can identify a real estate manager/developer who eventually will become owner/developer.

Physical

- Technology center is campus-like in character. Landscaped open spaces are part of each development zone.
- Only quality buildings with reuse potential for office, R&D, technology manufacturing are kept, consistent with the image of higher-market value special technologies.
- All buildings have their own boilers and chillers. Budget for office and R&D users' leasehold improvements goes beyond code compliance and is focused on investments necessary to attract higher-value uses.
- New roads are built to provide access to the main development portion of the site and connect Mound Avenue to Benner Road. All roads are upgraded in width and quality. Street trees in selected locations and parking with landscape improvements are included.
- Existing open space is improved with clearing and replanting where necessary.
- Raw land is developed with roads and infrastructure to create 5- to 10-acre individual sites for lease or sale.
- Design guidelines are established to provide standards for building coverage, open space, landscape, building placement and general architecture.

Operation and Management

- Because the technology center is an investment grade option, the assumption is that, in the relatively short term, a developer would be interested in acquiring the property. MMCIC may choose whether it will participate as part of a joint venture to operate and own the property. Through the leasing and development stage, the MMCIC would select, through a competitive process, a partner and phase out its own participation in the project. The strategy is to seek a university, industry or developer to purchase and/or assume property ownership.
- Cost-effective site services, beneficial to MATC businesses, are organized and provided.
- The main development portion of the site is operated as a single-owner property as are the other groupings of buildings that cannot be economically subdivided because of access, lot size, parking and other site features.
- The open space will be developed to a condition where individual lots can be leased or sold.

iamisburg Mound Reuse Plan

OPTION 3

Mound

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Building Information Summary: Option 3

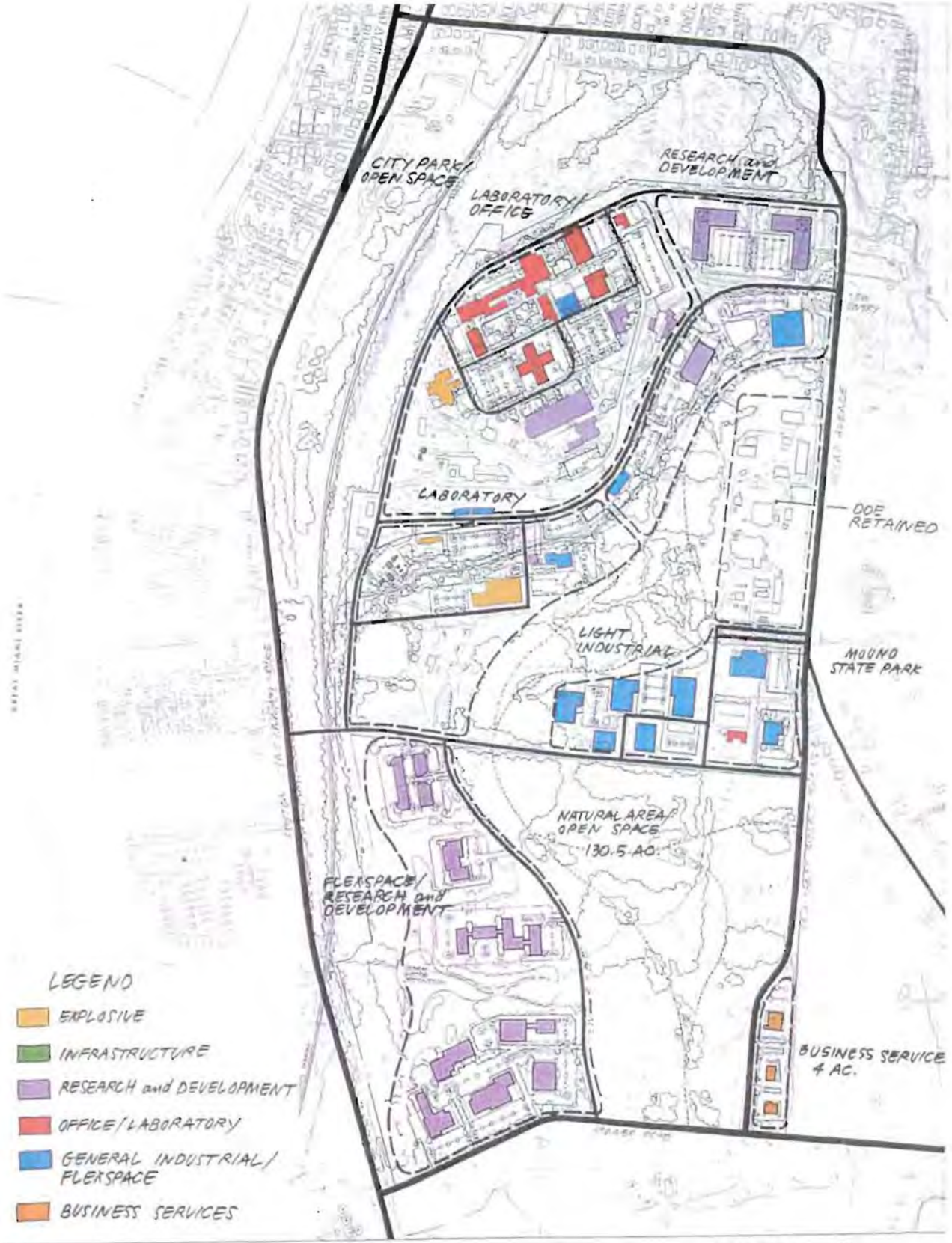
Gross floor area of existing buildings to be reused		**569,300**
Proposed uses		
Office	235,200	
General Industry	122,100	
Research and Development	138,300	
Explosive	69,600	
Infrastructure	4,100	
Note: 400 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		**766,900**
Buildings scheduled to be removed by DoE based on the ICP	284,800	
Buildings which have not been scheduled to be removed by DoE based on the ICP	260,600	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40		120,000 gsf	200,000 gsf	20,000 gsf		340,000 gsf*
SMPP	145,000 gsf					145,000 gsf*
Lower A			175,000 gsf			175,000 gsf*
Main Hill					130,000 gsf	130,000 gsf*
Test Fire			10,000 gsf			10,000 gsf*
Total	**145,000 gsf**	**120,000 gsf**	**385,000 gsf**	**20,000 gsf**	**130,000 gsf**	**800,000 gsf***

*Space developed by someone other than MMCIC. This option prepares sites for development.



OPTION 3

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corp.

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4. COST SUMMARY

Cost Estimates

Cost estimates were prepared for each of the three options. The following tables summarize costs for each of the options. Several assumptions underlie all options:

- All environmental cleanup cost will be the responsibility of the DoE and are not included in the estimates.
- All buildings and site features must be improved to a standard sufficient to be in accordance with local building codes and standards.
- All buildings and site feature must be improved to a level of repair sufficient for economically viable reuse.
- Building systems must be such that operating costs are market competitive.

The costs summaries were developed based upon planning assumptions as follows. It is important to note the estimates are to an "order-of-magnitude" accuracy, and do not reflect detailed analysis of existing conditions or detailed designs of building systems or building and site modifications. Prior to execution of any of the work outlined in these options and estimated in these summaries, more detailed engineering studies and estimates will be required.

Estimates for the three options are organized into site related and building related costs.

Site Related Costs

Potable Water

The existing SM/PP water tower can continue to be used and connected to the main Miamisburg City's water system in its medium pressure district. It is assumed that the City's water treatment plant will be expanded commensurate with additional water requirements. A new water line will be added to serve the south end of the site and connected to an existing 12 inch main line.

The Mound water wells can be used to provide firewater. The fire water pumps and storage tanks will be maintained.

Waste Water Treatment

Wastewater flow estimates are developed on the basis of four categories of facility use (Office, Laboratory, Light Industrial and Storage). The existing Mound

Wastewater Treatment Plant will be utilized and will be limited to application on the north end of the site.

The Miamisburg City's Wastewater System is assumed to be used for expansion for utilization by the south end of the site. The Miamisburg City's Pump Stations can be expanded if necessary to fulfill this need.

Electric

It is assumed that DP&L will take possession of the site distribution system. The costs to modify the system for separate services including duct banks and meter installation are estimated. Costs include relocating overhead circuits for the utility services to underground. Costs for construction of communication are identified for Alternates 2 and 3.

Gas

Gas costs are estimated for meters and extension of gas service from mains to the new boilers. It is assumed that the utility will install gas lines in the roadway corridor as required to serve the development.

Stormwater

Current USGS Map were used to determine drainage areas. The Rational Method was used in calculations. A 10 year frequency storm was used to determine rainfall intensity. Duration of the storm was assumed to be equal to the time of concentration for preliminary calculation purposes.

For preliminary calculations the three existing retention/detention pond were assumed to be unable to contribute to stormwater storage. Excavation/grading costs are based on standard unit cost per volume of material. Lump sums (non-detailed component costs) are used for the unit costs of the control structures in the proposed ponds.

Road Improvements

The City of Miamisburg standard is used for roads widths which necessitates widening of existing roadways. The use of existing roadways will be maximized through use of techniques involving reconstruction, asphalt mill/overlay and asphalt mill/joint repair/overlay. New construction is provided as required. Storm drainage is estimated for all roadways.

Roadway Lighting

Assumes standard cost per linear unit for general "ODOT" type lighting

Parking Lot Lighting

Assumes standard lighting cost per area based on the generally accepted illumination standard for parking lots.

Demolition of Stanchion Lines

These demolition costs are for removal of the existing overhead lines. It is assumed that this distribution system is replaced by building specific steam and chilled water systems. Air is not replaced and is the responsibility of building tenants.

Parking

Shared parking areas are assumed rather than separate parking lots for each building. This may require a variance from the Board of Appeals since new development usually requires separate parking lots. This assumption permits maximum utilization of existing parking areas. Miamisburg City standards are used for the determination of the number of spaces per area of Industrial and Professional Office space. Standard construction unit cost per area is utilized.

Miscellaneous Site Clean Up

At present the site is visually unattractive. In the past very low maintenance landscape materials were used. Under ideal circumstances the gravel used throughout the site would be removed and replaced with more natural materials. Recognizing the high cost of such an undertaking and the limited resources, Option 1 has recommended that a budget of $525,000 be set aside for restoring natural landscape materials at visually prominent locations. It is also anticipated that some of this money would be used to clean and improve selected areas, taking advantage of existing landscape materials, for removal of unneeded chain link fencing in visually prominent locations, and for limited signage improvement.

Formal Landscaped Areas

Recognizing that the image of the site will become increasingly important as the site is converted from public use (DoE) to private use, Option 2 and 3 have budgeted money to create and refine formal landscape treatment in specific

locations. These improvements involve demolition and removal of selected paved surfaces to create spaces with natural materials including grass, shrubs and shade trees. It is also envisioned that walks and pedestrian paths within formal landscaped areas will be paved with a relatively high quality material that will help distinguish these areas from the rest of the site. Based on previous experience this type of landscape treatment is estimated to cost between $325,000 and $350,000 an acre.

Natural Landscaped Areas

Inspection of the site identified the fact that most of the undeveloped areas of the property are covered with either pavement or gravel. It is envisioned that, in Option 2 and 3, some of these areas will be restored to a more natural landscape. This would include removal of gravel or paved surfaces and planting with meadow grasses and a limited number of trees. Assuming that soils in these areas do not contain hazardous materials, it is projected that the cost for this level of landscape restoration would range from $45,000 to $50,000 per acre.

Environmental

No environmental cleanup costs are included. It is assumed that all environmental corrective actions that may have an impact on the disposition of the buildings and site will be corrected as part of the existing Site Closure Plan. These are identified in the 13 volume *Environmental Appraisal Reports of the Mound Plant, March 29, 1966* and all appropriate *Phase I Environmental Site Assessment of DOE Mound Facilities reports.*

Asbestos-Containing Material (ACM) and Lead-Based Paint (LBP) will be disposed as identified in various reports. Barge, Waggoner, Sumner and Cannon (BWSC), *Mound Asbestos Survey, May, 1993*; BWSC, *Mound Asbestos Management Plan, September, 1993*; PEI Associates, Inc. (PEI), *Inventory and Assessment of ACM in Buildings of the EG&G Mound Applied Technologies Facilities, March, 1989*; and Tremco, Inc., *Thermocore Analysis, October 27, 1995.*

Building Related Costs

The comparison between alternatives for building related costs is organized differently than site costs. It is assumed that all buildings are brought up to a code level for all options. Option 1 lists those basic improvements and Options 2 and 3 list the differences from Option 1.

Costs to Bring Buildings up to Code

A cost to bring buildings up to code was developed based upon a review of existing data describing buildings and their condition, a site visit to confirm conditions and identify deficiencies, the preparation of a characterization of the condition of each building, and the preparation of an order of magnitude of cost estimates associated with required levels of improvement. Architectural improvements included modifications to fire alarm annunciation systems, emergency power systems, accessibility signage, hardware, toilet rooms, elevator controls and signals, egress stairs, and related construction demolition. Plumbing, mechanical, and electrical improvements that are code related include back flow preventors required on domestic water service entrances, floor drains in the manufacturing and laboratory buildings that are presently attached to the storm sewer system and must be plugged or rerouted to the sanitary sewer system, increased fresh air capacity for ventilation systems, and replacement of electrical water coolers that must be replaced to meet ADA requirements.

HVAC Improvements

The Heating/Cooling demands for each building were developed based on the potential utilization as: Administration (Office), Laboratory, Light Manufacturing, or Storage. Decentralized Heating and/or Cooling Plants are estimated for individual and, when appropriate, clustered buildings. As a result of utilization of the cost of individual components, costs for decentralized Boiler Plants and Air Cooled Chillers are estimated at a range of capacities.

These estimates include steam boilers and associated feed water equipment and pumps; steam and condensate piping to connect to existing distribution piping within the buildings; air-cooled chillers and associated pumps and piping as required to connect to existing distribution piping; incidental plumbing, insulation, controls; and an allowance for mechanical rooms/buildings to house boilers and associated equipment, pumps, etc. The boilers sized at 100 horsepower and above and to be "Ohio Special" fire tube boilers, will not require 24 hour surveillance by a licensed boiler operator.

Deferred Maintenance

Deferred maintenance costs are those costs necessary to bring buildings to a level of repair suitable for economically viable reuse. These costs are largely the consequence of the deferral of maintenance of roofs, windows, and building envelope. This evidently has resulted from decisions to avoid costs associated with maintenance of soon-to-be-closed and/or transferred buildings. These estimates are based upon observations of the buildings, determination of their

general condition and a professional assessment of the order-of-magnitude of maintenance needs. Estimates range from $1 per square foot for the newest buildings, to $10 per square foot for buildings requiring new roofs and windows.

Building Demolition

Buildings which are identified in the Integrated Comprehensive Plan (ICP), May 3, 1996, for demolition are not included in the cost estimate, i.e., they have been removed or will be demolished and costed under the ICP.

Buildings which are identified for demolition in this study are assumed to be clean. The cost to render the building clean is included in the ICP. Demolition costs have been estimated at a unit cost of $10 per square foot of building area.

Buildings whose final disposition is categorized as "Sell" in the ICP, i.e. the ICP premise is that the buildings will not be demolished, but the MMCIC has requested that they be demolished are included in this study. The demolition of additional buildings which are required to be removed in order to ensure the marketability of the site commensurate with the Alternates 2 and 3 are included as appropriate.

Total Construction Cost plus Contingency

To the total of the site and building costs is added a design and construction contingency of 25% to reflect the potential for additional costs that will be identified as the design of modifications is prepared, and as unexpected conditions are discovered during construction. It is anticipated that as the level of specificity of design is increased, this contingency can be reduced.

Indirect Costs

To the total of costs and contingency, an additional 25% in "soft costs" is added to reflect the non construction costs of fees, testing and project management.

Additional Tenant Improvements

Options 2 and 3 include costs identified as additional tenant improvements. This is an allowance for costs that will be incurred by the MMCIC as they seek to lease the properties to tenants demanding a higher level of "finish" of space than the basic level of improvement necessary to bring the buildings up to code compliance, operating efficiency and basic usable condition. These costs are included below the contingency line because they reflect what is an allowance required in the market. It is assumed that space improvements beyond this

allowance will be the responsibility of the tenant. Note that site improvements that are assumed to be necessary to meet the higher levels of market in Options 2 and 3 are estimated as part of site costs. They must be expended independent of the leasing arrangement, and must, therefore, be assumed as development costs.

Development Options

Option 1 costs include only those necessary to bring the site and buildings not demolished up to a basic standard of code compliance, condition and function suitable for leasing in the private market. In addition to modifications necessary for code compliance, this includes new steam and chilled water systems that will deliver energy at cost competitive rates, and deferred maintenance costs necessary to bring buildings to a market acceptable level of repair.

Option 2 site costs are increased to reflect increased investments in landscape, somewhat higher standard for roadways and parking lots, and more flexibility in utility system metering and hookups. Building related costs are reduced to reflect the demolition of more buildings. The budget allocation for additional tenant improvements is included at the bottom of the estimate.

Option 3 site costs are significantly higher because this option assumes land sales of land parcels of 3 to 5 acres that are serviced by roads and utilities. The costs reflect these additional roads and utility lines. Additionally, a rail underpass is assumed connecting to the highway, more is invested in landscape improvements, and site roads and parking is developed to a level commensurate with the "investment grade" development this option is intended to model. Additionally, tenant improvement allowances reflect this higher level of market.

Cost Information Summary: Option 1

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$675,000
Electric	$1,000,000
Gas	$300,000
Stormwater-Detention	$225,000
Stormwater-Sewer etc.	$1,750,000
Road Improvements	$975,000
Road Lighting	$525,000
Rail Road Underpass	$0
Parking	$1,025,000
Site Lighting	$400,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$525,000
Formal Landscaped Areas	$0
Natural Landscaped Areas	$0
Subtotal	***$7,800,000***

Item	*Projected Cost*
Cost to Bring Buildings up to Code	$9,000,000
HVAC Improvements	$6,600,000
Deferred Maintenance	$3,900,000
Building Demolition	$800,000
Subtotal	***$20,300,000***

Total Construction Cost	**$28,100,000**
Design and Construction Contingency 25%	$7,025,000
Subtotal	***$35,125,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$8,780,000
Total of all Costs	**$43,900,000**

Cost Information Summary: Option 2

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$825,000
Electric	$1,500,000
Gas	$400,000
Stormwater-Detention	$275,000
Stormwater-Sewer etc.	$2,150,000
Road Improvements	$1,275,000
Road Lighting	$675,000
Rail Road Underpass	$0
Parking	$1,250,000
Site Lighting	$500,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$0
Formal Landscaped Areas	$1,225,000
Natural Landscaped Areas	$215,000
Subtotal	***$10,690,000***

Building Related Costs

Item	*Projected Cost*
Base Improvements from Option 1	$20,300,000
Base Improvement Cost Adjustment[1]	$(2,400,000)
Additional Building Demolition[2]	$400,000
Subtotal	***$18,300,000***

Total Construction Cost	**$28,990,000**
Design and Construction Contingency 25%	$7,250,000
Subtotal	***$36,240,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$9,060,000
Subtotal	***$45,300,000***
Budget for Additional Tenant Improvements Above Code Upgrades	$4,500,000
Total of all Costs	**$49,800,000**

[1] An adjustment is made for those buildings scheduled for reuse in Option 1 but not scheduled for reuse in Option 2.
[2] Includes cost for demolition for buildings scheduled for Reuse in Option 1 but not scheduled for reuse in Option 2.

Cost Information Summary: Option 3

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$2,350,000
Electric	$2,250,000
Gas	$500,000
Stormwater-Detention	$425,000
Stormwater-Sewer etc.	$2,325,000
Road Improvements	$1,400,000
Road Lighting	$725,000
Rail Road Underpass	$2,500,000
Parking	$2,750,000
Site Lighting	$1,050,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$0
Formal Landscaped Areas	$2,100,000
Natural Landscaped Areas	$1,720,000
Subtotal	***$20,495,000***

Building Related Costs

Item	*Projected Cost*
Base Improvements from Option 1	$20,300,000
Base Improvement Cost Adjustment[3]	$(6,900,000)
Additional Building Demolition[4]	$1,800,000
Subtotal	***$15,200,000***

Total Construction Cost	**$35,695,000**
Design and Construction Contingency 25%	$8,920,000
Subtotal	***$44,615,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$11,150,000
Subtotal	***$55,765,000***
Budget for Additional Tenant Improvements Above Code Upgrades	$6,000,000
Total of all Costs	**$61,765,000**

[3] An adjustment was made for those buildings scheduled for reuse in Option 1 but not scheduled for reuse in Option 3.

[4] Includes cost for demolition for buildings scheduled for Reuse in Option 1 but not scheduled for reuse in Option 3.

Miamisburg Mound Comprehensive Reuse Plan

Development Options Summary
Technical Appendices

Prepared for:
Miamisburg Mound Community
Improvement Corporation

Prepared by:
Sasaki Associates, Inc.

in association with
URS Consultants
Economics Research Associates
Hamilton, Rabinovitz & Alschuler
Environmental Technologies & Communication

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Development Option 1

Building Information Summary *Table 1-1*

Gross floor area of existing buildings to be reused		**795,900**
Proposed uses		
Office	253,200	
General Industry	240,400	
Research and Development	150,300	
Explosive	139,400	
Infrastructure	12,600	
Note: 49,700 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		**540,300**
Buildings scheduled to be removed by DoE based on the ICP	235,500	
Buildings which have not been scheduled to be removed by DoE based on the ICP	83,300	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40	400,000 gsf			20,000 gsf		**420,000 gsf***
SMPP	145,000 gsf					**145,000 gsf***
Total	**545,000 gsf**			**20,000 gsf**		**565,000 gsf***

*- space developed by someone other than MMCIC

Development Option 1

Cost Information Summary - Table 1-2

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$675,000
Electric	$1,000,000
Gas	$300,000
Stormwater - Detention	$225,000
Stormwater - Sewer etc.	$1,750,000
Road Improvements	$975,000
Road Lighting	$525,000
Rail Road Underpass	$0
Parking	$1,025,000
Site Lighting	$400,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$525,000
Formal Landscaped Areas	$0
Natural Landscaped Areas	$0
Subtotal	***$7,800,000***

Building Related Costs

Item	*Projected Cost*
Cost to Bring Buildings up to Code	$9,000,000
HVAC Improvements	$6,600,000
Deferred Maintenance	$3,900,000
Building Demolition	$800,000
Subtotal	***$20,300,000***

Total Construction Cost	**$28,100,000**
Design and Construction Contingency 25%	$7,025,000
Subtotal	***$35,125,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$8,780,000
Total of all Costs	**$43,900,000**

Option 1 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Cost to Bring Building Up to Code	Cost to Improve Plumbing/Mechanical/Electrical to Code	Cost to Upgrade HVAC	Deferred Maintenance	Cost to Demolish Building	Base Improvement Cost
Buildings Scheduled for Reuse								
3	Explosives Testing	12.4	$ 186,000	$ 5,600	$ 81,096	$ 86,800	$ -	$ 359,496
22	Warehouse	9.1	$ 72,800	$ 5,900	$ -	$ 27,300		$ 106,000
24	Potable Water Treatment	0.8	$ -	$ 500	$ -	$ -		$ 500
27	Adv Dev Programs	5.3	$ 79,500	$ 2,400	$ 47,912	$ 37,100		$ 166,912
28	Ceramic Production	11.3	$ 90,400	$ 5,100	$ 158,200	$ 45,200		$ 298,900
35	Neutron Radiography	2.5	$ -	$ 1,100	$ 43,800	$ 7,500		$ 52,400
40	Printing Shop	12.2	$ 146,400	$ 6,100	$ 110,776	$ 48,800		$ 312,076
45	Health Physics	9.58	$ 47,900	$ 4,300	$ -	$ 9,580		$ 61,780
46	Welding Dev.	2.4	$ 36,000	$ 1,100	$ -	$ 4,800		$ 41,900
48	Surveillance	8	$ 120,000	$ 3,600	$ 127,200	$ 40,000		$ 290,800
49	Timer Fabrication	14.9	$ 223,500	$ 6,700	$ 106,535	$ 104,300		$ 441,035
56	Fire Pump	0.6	$ -	$ 400	$ -	$ -		$ 400
57	Sanitary Sewer Treatment	0.5	$ -	$ 300	$ -	$ -		$ 300
60	Ceramic Production	4	$ 60,000	$ 1,800	$ 56,000	$ 20,000		$ 137,800
61	Warehouse	45.5	$ 546,000	$ 22,800	$ 147,420	$ 136,500		$ 852,720
63	Quality/Product Test	16.5	$ 132,000	$ 8,300	$ 106,590	$ 49,500		$ 296,390
67	Energetic Material Supp	3.8	$ 57,000	$ 1,700	$ 43,814	$ 26,600		$ 129,114
80	Magazine	0.3	$ -	$ -	$ -	$ -		$ -
81	Magazine	0.3	$ -	$ -	$ -	$ -		$ -
82	Magazine	0.3	$ -	$ -	$ -	$ -		$ -
83	Magazine	0.3	$ -	$ -	$ -	$ -		$ -
84	Magazine	0.3	$ -	$ -	$ -	$ -		$ -
85	Power Blend/Process	3.2	$ 25,600	$ 1,400	$ -	$ 6,400		$ 33,400
87	Explosives Testing	38.9	$ 311,200	$ 17,500	$ 147,431	$ 77,800		$ 553,931
89	Detonator Storage	4.8	$ 38,400	$ 2,200	$ 43,584	$ 19,200		$ 103,384
94	Materials Compatibility	1.2	$ -	$ 500	$ 29,484	$ 8,400		$ 38,384
98	Central Fire Station	8.5		$ 5,500	$ 81,005	$ 42,500		$ 129,005
99	Security Ops	11.4	$ 171,000	$ 5,700	$ 103,512	$ 57,000		$ 337,212

Option 1 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Cost to Bring Building Up to Code	Cost to Improve Plumbing/Mechanical/Electrical to Code	Cost to Upgrade HVAC	Deferred Maintenance	Cost to Demolish Building	Base Improvement Cost
100	Security Precinct	6.3	$ 50,400	$ 3,200	$ -	$ 25,200		$ 78,800
104	Test Fire Maintenance	1.8	$ 14,400	$ 800	$ -	$ 5,400		$ 20,600
105	Parts Machining	31.9	$ 255,200	$ 14,400	$ 470,525	$ 95,700		$ 835,825
110	Fuel Storage Tanks	0			$ -	$ -		$ -
112	Sanitary Disposal Sand Filter	0.8		$ 500	$ -	$ -		$ 500
113	Sanitary Disposal Dewatering	0.5		$ 300	$ -	$ -		$ 300
A	Administration	55.6	$ 778,400	$ 27,800	$ 312,472	$ 389,200		$ 1,507,872
B	Adv Dev Inert Prod	27.7	$ 346,250	$ 12,500	$ 337,109	$ 277,000		$ 972,859
COS	Central Ops Supp	64.7	$ 517,600	$ 29,100	$ 623,061	$ 129,400		$ 1,299,161
DS	Dev. & Stds. Lab	47.8	$ 573,600	$ 21,500	$ 480,390	$ 143,400		$ 1,218,890
E	Adv Dev Production	29.8	$ 298,000	$ 13,400	$ 240,188	$ 149,000		$ 700,588
E-Annex	Offices	18	$ 180,000	$ 9,000	$ 145,080	$ 90,000		$ 424,080
G	Garage	7.5	$ 75,000	$ 3,400	$ 119,025	$ 75,000		$ 272,425
GH	Employment	5.3	$ 63,600	$ 2,700	$ -	$ 26,500		$ 92,800
GW	Bonded Stores	9.8	$ 98,000	$ 4,400	$ 155,526	$ 49,000		$ 306,926
I	High Expl Prod	25.7	$ 308,400	$ 11,600	$ 315,082	$ 128,500		$ 763,582
M	Machine/Elect Shops	56	$ 784,000	$ 25,200	$ 696,640	$ 560,000		$ 2,065,840
OSE	Opns Supp (E)	90.1	$ 720,800	$ 45,100	$ 506,362	$ 270,300		$ 1,542,562
OSW	Opns Supp (W)	54.3	$ 760,200	$ 27,200	$ 305,166	$ 434,400		$ 1,526,966
W	Maintenance Shops	32.5	$ 455,000	$ 14,600	$ 483,275	$ 162,500		$ 1,115,375
WH1	Well House	0.4	$ -	$ 300	$ -	$ -		$ 300
WH2	Well House	0.4	$ -	$ 300	$ -	$ -		$ 300
WH3	Well House	0.1	$ -	$ 100	$ -	$ -		$ 100
	TOTAL	795.88	$ 8,622,550	$ 377,900	$ 6,624,260	$ 3,865,780	$ -	$ 19,490,490

Option 1 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Cost to Bring Building Up to Code	Cost to Improve Plumbing/Mechanical/Electrical to Code	Cost to Upgrade HVAC	Deferred Maintenance	Cost to Demolish Building	Base Improvement Cost
Buildings Scheduled to be Removed								
1	Expl Prod Supp	1						$ -
2	Explosives Testing	6.3					$ 63,000	$ 63,000
4	Dosimetry	0.67					$ 6,700	$ 6,700
5	Magazine	0.3						$ -
6	Magazine	0.09						$ -
7	Magazine	0.4						$ -
8	Magazine	0.07						$ -
10	Magazine	0.07						$ -
11	Magazine	0.4						$ -
13	Firing Shed	0.05						$ -
19	Salvage and Sales	4.5					$ 45,000	$ 45,000
20	Magazine	0.3						$ -
21	Raw Material Storage	4.1						$ -
23	Waste Material Staging	3.4					$ 34,000	$ 34,000
25	Weather Station	0.4						$ -
29	Adv Dev Plastics	6.6					$ 66,000	$ 66,000
30	Adv Dev & Health Phys	0.7						$ -
31	Contaminated Waste	8.7						$ -
33	SM Area Maintenance	1.3						$ -
34	Fire Training	1.1						$ -
36	RTG Support	4.3						$ -
37	Adhesive Formulation	2.5						$ -
38	Nuc Opns Prog & D&D	44.3						$ -
39	Nuclear Opns Support	3.5						$ -
42	High Expl Production	2.9					$ 29,000	$ 29,000
43	Thermite Development	1.5					$ 15,000	$ 15,000
44	Cafeteria	2.5						$ -
47	Security	3.6						$ -

Option 1 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Cost to Bring Building Up to Code	Cost to Improve Plumbing/Mechanical/Electrical to Code	Cost to Upgrade HVAC	Deferred Maintenance	Cost to Demolish Building	Base Improvement Cost
50	RGT Assembly & Test	14.8						$ -
51	Development	3.5					$ 35,000	$ 35,000
52	Magazine	0.08						$ -
53	Magazine	0.2						$ -
54	Magazine	0.3						$ -
55	Waste Mgmt	0.3						$ -
58	Filter Bank	6.6						$ -
59	Neutron Radiography	0.7						$ -
64	Magazine	0.07						$ -
68	D&D Staging Area	2						$ -
71	Flammable Liquid Storage	0.8						$ -
72	Hazardous Waste Storage	2.4					$ 24,000	$ 24,000
73	Gas Cylinder Storage	2.2					$ 22,000	$ 22,000
74	Storage	0.4						$ -
79	Waste Mgmt Supp	1.7						$ -
88	RTG Admin Supp	7.2						$ -
90	Retort (Explosive Waste)	0.7					$ 7,000	$ 7,000
91	Admin/Training	8.1						$ -
92	Prod Training	1.6					$ 16,000	$ 16,000
93	Standards Supp	2.9					$ 29,000	$ 29,000
95	Utilities Operations-SM	2						$ -
96	Armored Vehicle Shelter	0.4					$ 4,000	$ 4,000
101	Engrg Supp	1.8						$ -
102	R.T.G. Program	11						$ -
114	Nitrogen Separation	0.03						$ -
120	Health Physics Storage	0.05	$ -	$ -	$ -	$ -		$ -
C	Records Storage	13.4						$ -
EG-1	Electrical Generator	0.24						$ -
EG-2	Electrical Generator	0.24						$ -

Option 1 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Cost to Bring Building Up to Code	Cost to Improve Plumbing/Mechanical/Electrical to Code	Cost to Upgrade HVAC	Deferred Maintenance	Cost to Demolish Building	Base Improvement Cost
EG-4	Electrical Generator	0.14						$ -
EG-6	Electrical Generator	0.24						$ -
EG-7	Electrical Generator	0.08						$ -
GIS	Guard Island	0.2					$ 2,000	$ 2,000
GP1	Guard Post #1	7.8					$ 78,000	$ 78,000
GP44	Clothing Issue	0.4						$ -
H	Laundry	17.3					$ 173,000	$ 173,000
HH	Isotope Separation	15.3						$ -
P	Power House Main Hill	15.1					$ 151,000	$ 151,000
PH	Power House	0.646					$ 6,460	$ 6,460
PS	Paint Shop	2.3						$ -
R	Research Lab	55						$ -
SD	Sanitary Treatment (Not in Service)	1.6						$ -
SM*	Demolished Nuclear Production Building	0						$ -
SST	Salt Storage	0.6					$ 6,000	$ 6,000
SW	Tritium R&D	43.1						$ -
T	Nuclear Operations	173						$ -
WD	Radioactive Waste Treatment	16.2						$ -
	TOTAL	540.266	$ -	$ -	$ -	$ -	$ 812,160	$ 812,160
Option 1 Totals		1336.146	$ 8,622,550	$ 377,900	$ 6,624,260	$ 3,865,780	$ 812,160	$ 20,302,650

Development Option 2

Building Information Summary *Table 2-1*

Gross floor area of existing buildings to be reused		707,100
Proposed uses		
Office	235,200	
General Industry	178,100	
Research and Development	150,300	
Explosive	130,900	
Infrastructure	12,600	
Note: 1,900 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		629,100
Buildings scheduled to be removed by DoE based on the ICP	283,300	
Buildings which have not been scheduled to be removed by DoE based on the ICP	124,300	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40	140,000 gsf	150,000 gsf				290,000 gsf*
SMPP	145,000 gsf					145,000 gsf*
Lower A			180,000 gsf			180,000 gsf*
Main Hill					100,000 gsf	100,000 gsf*
Total	285,000 gsf	150,000 gsf	180,000 gsf		100,000 gsf	715,000 gsf*

*- space developed by someone other than MMCIC

Development Option 2
Cost Information Summary ***Table 2-2***

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$825,000
Electric	$1,500,000
Gas	$400,000
Stormwater - Detention	$275,000
Stormwater - Sewer etc.	$2,150,000
Road Improvements	$1,275,000
Road Lighting	$675,000
Rail Road Underpass	$0
Parking	$1,250,000
Site Lighting	$500,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$0
Formal Landscaped Areas	$1,225,000
Natural Landscaped Areas	$215,000
Subtotal	***$10,690,000***

Building Related Costs

Item	*Projected Cost*
Base Improvements from Option 1	$20,300,000
Base Improvement Cost Adjustment[1]	$(2,400,000)
Additional Building Demolition[2]	$400,000
Subtotal	***$18,300,000***

Total Construction Cost	**$28,990,000**
Design and Construction Contingency 25%	$7,250,000
Subtotal	***$36,240,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$9,060,000
Subtotal	***$45,300,000***
Budget for Additional Tenant Improvements Above Code Improvements	$4,500,000
Total of all Costs	**$49,800,000**

[1] An adjustment is made for those buildings scheduled for reuse in Option 1 but not scheduled for reuse in Option 2.
[2] Includes cost for demolition for buildings scheduled for Reuse in Option 1 but not scheduled for reuse in Option 2.

Option 2 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
Buildings Scheduled for Reuse							
3	Explosives Testing	12.4	$ 359,496		$ 24,800		$ 384,296
22	Warehouse	9.1	$ 106,000		$ 18,200		$ 124,200
24	Potable Water Treatment	0.8	$ 500		$ -		$ 500
28	Ceramic Production	11.3	$ 298,900		$ 113,000		$ 411,900
35	Neutron Radiography	2.5	$ 52,400		$ 25,000		$ 77,400
40	Printing Shop	12.2	$ 312,076		$ 122,000		$ 434,076
45	Health Physics	9.6	$ 61,780		$ 95,800		$ 157,580
46	Welding Dev.	2.4	$ 41,900		$ 24,000		$ 65,900
48	Surveillance	8.0	$ 290,800		$ 80,000		$ 370,800
49	Timer Fabrication	14.9	$ 441,035		$ 29,800		$ 470,835
56	Fire Pump	0.6	$ 400		$ -		$ 400
57	Sanitary Sewer Treatment	0.5	$ 300		$ -		$ 300
60	Ceramic Production	4.0	$ 137,800		$ 40,000		$ 177,800
61	Warehouse	45.5	$ 852,720		$ 91,000		$ 943,720
63	Quality/Product Test	16.5	$ 296,390		$ 33,000		$ 329,390
67	Energetic Material Supp	3.8	$ 129,114		$ 7,600		$ 136,714
80	Magazine	0.3	$ -		$ 600		$ 600
81	Magazine	0.3	$ -		$ 600		$ 600
82	Magazine	0.3	$ -		$ 600		$ 600
83	Magazine	0.3	$ -		$ 600		$ 600
84	Magazine	0.3	$ -		$ 600		$ 600
87	Explosives Testing	38.9	$ 553,931		$ 77,800		$ 631,731
89	Detonator Storage	4.8	$ 103,384		$ 9,600		$ 112,984
94	Materials Compatibility	1.2	$ 38,384		$ 2,400		$ 40,784
98	Central Fire Station	8.5	$ 129,005		$ -		$ 129,005
99	Security Ops	11.4	$ 337,212		$ 114,000		$ 451,212
100	Security Precinct	6.3	$ 78,800		$ 63,000		$ 141,800
104	Test Fire Maintenance	1.8	$ 20,600		$ 3,600		$ 24,200
105	Parts Machining	31.9	$ 835,825		$ 63,800		$ 899,625

Option 2 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
110	Fuel Storage Tanks	0.0	$ -		$ -		$ -
112	Sanitary Disposal Sand Filter	0.8	$ 500		$ -		$ 500
113	Sanitary Disposal Dewatering	0.5	$ 300		$ -		$ 300
A	Administration	55.6	$ 1,507,872		$ 556,000		$ 2,063,872
B	Adv Dev Inert Prod	27.7	$ 972,859		$ 55,400		$ 1,028,259
COS	Central Ops Supp	64.7	$ 1,299,161		$ 647,000		$ 1,946,161
DS	Dev. & Stds. Lab	47.8	$ 1,218,890		$ 478,000		$ 1,696,890
G	Garage	7.5	$ 272,425		$ 15,000		$ 287,425
GH	Employment	5.3	$ 92,800		$ 53,000		$ 145,800
GW	Bonded Stores	9.8	$ 306,926		$ 19,600		$ 326,526
I	High Expl Prod	25.7	$ 763,582		$ 51,400		$ 814,982
M	Machine/Elect Shops	56.0	$ 2,065,840		$ 112,000		$ 2,177,840
OSE	Opns Supp (E)	90.1	$ 1,542,562		$ 901,000		$ 2,443,562
OSW	Opns Supp (W)	54.3	$ 1,526,966		$ 543,000		$ 2,069,966
WH1	Well House	0.4	$ 300		$ -		$ 300
WH2	Well House	0.4	$ 300		$ -		$ 300
WH3	Well House	0.1	$ 100		$ -		$ 100
	TOTAL	707.1	$ 17,050,135	$ -	$ 4,472,800	$ -	$ 21,522,935

Option 2 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
Buildings Scheduled to be Removed							
1	Expl Prod Supp	1	$ -				$ -
2	Explosives Testing	6.3	$ 63,000				$ 63,000
4	Dosimetry	0.67	$ 6,700				$ 6,700
5	Magazine	0.3	$ -				$ -
6	Magazine	0.09	$ -				$ -
7	Magazine	0.4	$ -				$ -
8	Magazine	0.07	$ -				$ -
10	Magazine	0.07	$ -				$ -
11	Magazine	0.4	$ -				$ -
13	Firing Shed	0.05	$ -				$ -
19	Salvage and Sales	4.5	$ 45,000				$ 45,000
20	Magazine	0.3	$ -				$ -
21	Raw Material Storage	4.1	$ -				$ -
23	Waste Material Staging	3.4	$ 34,000				$ 34,000
25	Weather Station	0.4	$ -				$ -
27	Adv Dev Programs	5.3	$ 166,912	$ (166,912)		$ 53,000	$ 53,000
29	Adv Dev Plastics	6.6	$ 66,000				$ 66,000
30	Adv Dev & Health Phys	0.7	$ -				$ -
31	Contaminated Waste	8.7	$ -				$ -
33	SM Area Maintenance	1.3	$ -				$ -
34	Fire Training	1.1	$ -				$ -
36	RTG Support	4.3	$ -				$ -
37	Adhesive Formulation	2.5	$ -				$ -
38	Nuc Opns Prog & D&D	44.3	$ -				$ -
39	Nuclear Opns Support	3.5	$ -				$ -
42	High Expl Production	2.9	$ 29,000				$ 29,000
43	Thermite Development	1.5	$ 15,000				$ 15,000
44	Cafeteria	2.5	$ -				$ -

Option 2 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
47	Security	3.6	$ -				$ -
50	RGT Assembly & Test	14.8	$ -				$ -
51	Development	3.5	$ 35,000				$ 35,000
52	Magazine	0.08	$ -				$ -
53	Magazine	0.2	$ -				$ -
54	Magazine	0.3	$ -				$ -
55	Waste Mgmt	0.3	$ -				$ -
58	Filter Bank	6.6	$ -				$ -
59	Neutron Radiography	0.7	$ -				$ -
64	Magazine	0.07	$ -				$ -
68	D&D Staging Area	2	$ -				$ -
71	Flammable Liquid Storage	0.8	$ -				$ -
72	Hazardous Waste Storage	2.4	$ 24,000				$ 24,000
73	Gas Cylinder Storage	2.2	$ 22,000				$ 22,000
74	Storage	0.4	$ -				$ -
79	Waste Mgmt Supp	1.7	$ -				$ -
85	Power Blend/Process	3.2	$ 33,400	$ (33,400)		$ 32,000	$ 32,000
88	RTG Admin Supp	7.2	$ -				$ -
90	Retort (Explosive Waste)	0.7	$ 7,000				$ 7,000
91	Admin/Training	8.1	$ -				$ -
92	Prod Training	1.6	$ 16,000				$ 16,000
93	Standards Supp	2.9	$ 29,000				$ 29,000
95	Utilities Operations-SM	2	$ -				$ -
96	Armored Vehicle Shelter	0.4	$ 4,000				$ 4,000
101	Engrg Supp	1.8	$ -				$ -
102	R.T.G. Program	11	$ -				$ -
114	Nitrogen Separation	0.03	$ -				$ -
120	Health Physics Storage	0.05	$ -		$ -		$ -
C	Records Storage	13.4	$ -				$ -

Option 2 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
E	Adv Dev Production	29.8	$ 700,588	$ (700,588)			$ -
E-Annex	Offices	18	$ 424,080	$ (424,080)			$ -
EG-1	Electrical Generator	0.24	$ -				$ -
EG-2	Electrical Generator	0.24	$ -				$ -
EG-4	Electrical Generator	0.14	$ -				$ -
EG-6	Electrical Generator	0.24	$ -				$ -
EG-7	Electrical Generator	0.08	$ -				$ -
GIS	Guard Island	0.2	$ 2,000				$ 2,000
GP1	Guard Post #1	7.8	$ 78,000				$ 78,000
GP44	Clothing Issue	0.4	$ -				$ -
H	Laundry	17.3	$ 173,000				$ 173,000
HH	Isotope Separation	15.3	$ -				$ -
P	Power House Main Hill	15.1	$ 151,000				$ 151,000
PH	Power House	0.646	$ 6,460				$ 6,460
PS	Paint Shop	2.3	$ -				$ -
R	Research Lab	55	$ -				$ -
SD	Sanitary Treatment (Not in Service)	1.6	$ -				$ -
SM*	Demolished Nuclear Production Building	0.	$ -				$ -
SST	Salt Storage	0.6	$ 6,000				$ 6,000
SW	Tritium R&D	43.1	$ -				$ -
T	Nuclear Operations	173	$ -				$ -
W	Maintenance Shops	32.5	$ 1,115,375	$ (1,115,375)		$ 325,000	$ 325,000
WD	Radioactive Waste Treatment	16.2	$ -				$ -
	TOTAL	629.066	$ 3,252,515	$ (2,440,355)	$ -	$ 410,000	$ 1,222,160
Option 2 Totals		1336.146	$ 20,302,650	$ (2,440,355)	$ 4,472,800	$ 410,000	$ 22,745,095

Development Option 3

Building Information Summary *Table 3-1*

Gross floor area of existing buildings to be reused		569,300
Proposed uses		
Office	235,200	
General Industry	122,100	
Research and Development	138,300	
Explosive	69,600	
Infrastructure	4,100	
Note: 400 gsf of the building space to be reused is scheduled to be removed by the DoE		

Buildings scheduled for demolition		766,900
Buildings scheduled to be removed by DoE based on the ICP	284,800	
Buildings which have not been scheduled to be removed by DoE based on the ICP	260,600	
Unwanted buildings not scheduled for demolition within the SM-PP area.	48,500	
T Building	173,000	

New Construction

Area	Lt. Industrial	Flex	R&D	Business Services	Lab/Office	Total
South 40		120,000 gsf	200,000 gsf	20,000 gsf		340,000 gsf*
SMPP	145,000 gsf					145,000 gsf*
Lower A			175,000 gsf			175,000 gsf*
Main Hill					130,000 gsf	130,000 gsf*
Test Fire			10,000 gsf			10,000 gsf*
Total	145,000 gsf	120,000 gsf	385,000 gsf	20,000 gsf	130,000 gsf	800,000 gsf*

*- space developed by someone other than MMCIC

Development Option 3

Cost Information Summary *Table 3-2*

Site Related Costs

Item	*Projected Cost*
Water/Wastewater	$2,350,000
Electric	$2,250,000
Gas	$500,000
Stormwater - Detention	$425,000
Stormwater - Sewer etc.	$2,325,000
Road Improvements	$1,400,000
Road Lighting	$725,000
Rail Road Underpass	$2,500,000
Parking	$2,750,000
Site Lighting	$1,050,000
Demolition of Stanchion Lines	$400,000
Miscellaneous Site Cleanup	$0
Formal Landscaped Areas	$2,100,000
Natural Landscaped Areas	$1,720,000
Subtotal	***$20,495,000***

Building Related Costs

Item	*Projected Cost*
Base Improvements from Option 1	$20,300,000
Base Improvement Cost Adjustment[1]	$(6,900,000)
Additional Building Demolition[2]	$1,800,000
Subtotal	***$15,200,000***

Total Construction Cost	**$35,695,000**
Design and Construction Contingency 25%	$8,920,000
Subtotal	***$44,615,000***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$11,150,000
Subtotal	***$55,765,000***
Additional Tenant Improvements	$6,000,000
Total of all Costs	**$61,765,000**

[1] An adjustment was made for those buildings scheduled for reuse in Option 1 but not scheduled for reuse in Option 3.

[2] Includes cost for demolition for buildings scheduled for Reuse in Option 1 but not scheduled for reuse in Option 3.

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
Buildings Scheduled for Reuse							
22	Warehouse	9.1	$ 106,000		$ 36,400		$ 142,400
24	Potable Water Treatment	0.8	$ 500		$ -		$ 500
28	Ceramic Production	11.3	$ 298,900		$ 135,600		$ 434,500
35	Neutron Radiography	2.5	$ 52,400		$ 30,000		$ 82,400
40	Printing Shop	12.2	$ 312,076		$ 183,000		$ 495,076
45	Health Physics	9.6	$ 61,780		$ 114,960		$ 176,740
46	Welding Dev.	2.4	$ 41,900		$ 28,800		$ 70,700
56	Fire Pump	0.6	$ 400		$ -		$ 400
57	Sanitary Sewer Treatment	0.5	$ 300		$ -		$ 300
61	Warehouse	45.5	$ 852,720		$ 182,000		$ 1,034,720
63	Quality/Product Test	16.5	$ 296,390		$ 66,000		$ 362,390
67	Energetic Material Supp	3.8	$ 129,114		$ 15,200		$ 144,314
87	Explosives Testing	38.9	$ 553,931		$ 155,600		$ 709,531
94	Materials Compatibility	1.2	$ 38,384		$ 4,800		$ 43,184
99	Security Ops	11.4	$ 337,212		$ 171,000		$ 508,212
100	Security Precinct	6.3	$ 78,800		$ 94,500		$ 173,300
104	Test Fire Maintenance	1.8	$ 20,600		$ 7,200		$ 27,800
105	Parts Machining	31.9	$ 835,825		$ 127,600		$ 963,425
110	Fuel Storage Tanks	0.0	$ -		$ -		$ -
112	Sanitary Disposal Sand Filter	0.8	$ 500		$ -		$ 500
113	Sanitary Disposal Dewatering	0.5	$ 300		$ -		$ 300
A	Administration	55.6	$ 1,507,872		$ 834,000		$ 2,341,872
COS	Central Ops Supp	64.7	$ 1,299,161		$ 776,400		$ 2,075,561
DS	Dev. & Stds. Lab	47.8	$ 1,218,890		$ 573,600		$ 1,792,490
G	Garage	7.5	$ 272,425		$ 30,000		$ 302,425
GH	Employment	5.3	$ 92,800		$ 79,500		$ 172,300
GW	Bonded Stores	9.8	$ 306,926		$ 39,200		$ 346,126
I	High Expl Prod	25.7	$ 763,582		$ 102,800		$ 866,382

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
OSE	Opns Supp (E)	90.1	$ 1,542,562		$ 1,351,500		$ 2,894,062
OSW	Opns Supp (W)	54.3	$ 1,526,966		$ 814,500		$ 2,341,466
WH1	Well House	0.4	$ 300		$ -		$ 300
WH2	Well House	0.4	$ 300		$ -		$ 300
WH3	Well House	0.1	$ 100		$ -		$ 100
	TOTAL	569.3	$ 12,549,916	$ -	$ 5,954,160	$ -	$ 18,504,076

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
Buildings Scheduled to be Removed							
1	Expl Prod Supp	1.0	$ -				$ -
2	Explosives Testing	6.3	$ 63,000				$ 63,000
3	Explosives Testing	12.4	$ 359,496	$ (359,496)		$ 124,000	$ 124,000
4	Dosimetry	0.7	$ 6,700				$ 6,700
5	Magazine	0.3	$ -				$ -
6	Magazine	0.1	$ -				$ -
7	Magazine	0.4	$ -				$ -
8	Magazine	0.1	$ -				$ -
10	Magazine	0.1	$ -				$ -
11	Magazine	0.4	$ -				$ -
13	Firing Shed	0.1	$ -				$ -
19	Salvage and Sales	4.5	$ 45,000				$ 45,000
20	Magazine	0.3	$ -				$ -
21	Raw Material Storage	4.1	$ -				$ -
23	Waste Material Staging	3.4	$ 34,000				$ 34,000
25	Weather Station	0.4	$ -				$ -
27	Adv Dev Programs	5.3	$ 166,912	$ (166,912)		$ 53,000	$ 53,000
29	Adv Dev Plastics	6.6	$ 66,000				$ 66,000
30	Adv Dev & Health Phys	0.7	$ -				$ -
31	Contaminated Waste	8.7	$ -				$ -
33	SM Area Maintenance	1.3	$ -				$ -
34	Fire Training	1.1	$ -				$ -
36	RTG Support	4.3	$ -				$ -
37	Adhesive Formulation	2.5	$ -				$ -
38	Nuc Opns Prog & D&D	44.3	$ -				$ -
39	Nuclear Opns Support	3.5	$ -				$ -
42	High Expl Production	2.9	$ 29,000				$ 29,000
43	Thermite Development	1.5	$ 15,000				$ 15,000

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
44	Cafeteria	2.5	$ -				$ -
47	Security	3.6	$ -				$ -
48	Surveillance	8.0	$ 290,800	$ (290,800)		$ 80,000	$ 80,000
49	Timer Fabrication	14.9	$ 441,035	$ (441,035)		$ 149,000	$ 149,000
50	RGT Assembly & Test	14.8	$ -				$ -
51	Development	3.5	$ 35,000				$ 35,000
52	Magazine	0.1	$ -				$ -
53	Magazine	0.2	$ -				$ -
54	Magazine	0.3	$ -				$ -
55	Waste Mgmt	0.3	$ -	$ -			$ -
58	Filter Bank	6.6	$ -				$ -
59	Neutron Radiography	0.7	$ -				$ -
60	Ceramic Production	4.0	$ 137,800	$ (137,800)		$ 40,000	$ 40,000
64	Magazine	0.1	$ -				$ -
68	D&D Staging Area	2.0	$ -				$ -
71	Flammable Liquid Storage	0.8	$ -				$ -
72	Hazardous Waste Storage	2.4	$ 24,000				$ 24,000
73	Gas Cylinder Storage	2.2	$ 22,000				$ 22,000
74	Storage	0.4	$ -				$ -
79	Waste Mgmt Supp	1.7	$ -				$ -
80	Magazine	0.3	$ -	$ -			$ -
81	Magazine	0.3	$ -	$ -		$ -	$ -
82	Magazine	0.3	$ -	$ -		$ -	$ -
83	Magazine	0.3	$ -	$ -		$ -	$ -
84	Magazine	0.3	$ -	$ -		$ -	$ -
85	Power Blend/Process	3.2	$ 33,400	$ (33,400)		$ 32,000	$ 32,000
88	RTG Admin Supp	7.2	$ -				$ -
89	Detonator Storage	4.8	$ 103,384	$ (103,384)		$ 48,000	$ 48,000
90	Retort (Explosive Waste)	0.7	$ 7,000				$ 7,000

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
91	Admin/Training	8.1	$ -				$ -
92	Prod Training	1.6	$ 16,000				$ 16,000
93	Standards Supp	2.9	$ 29,000				$ 29,000
95	Utilities Operations-SM	2.0	$ -				$ -
96	Armored Vehicle Shelter	0.4	$ 4,000				$ 4,000
98	Central Fire Station	8.5	$ 129,005	$ (129,005)		$ 85,000	$ 85,000
101	Engrg Supp	1.8	$ -				$ -
102	R.T.G. Program	11.0	$ -	$ -			$ -
114	Nitrogen Seperation	0.0	$ -	$ -			$ -
120	Health Physics Storage	0.1	$ -		$ -		$ -
B	Adv Dev Inert Prod	27.7	$ 972,859	$ (972,859)		$ 277,000	$ 277,000
C	Records Storage	13.4	$ -				$ -
E	Adv Dev Production	29.8	$ 700,588	$ (700,588)			$ -
E-Annex	Offices	18.0	$ 424,080	$ (424,080)			$ -
EG-1	Electrical Generator	0.2	$ -				$ -
EG-2	Electrical Generator	0.2	$ -				$ -
EG-4	Electrical Generator	0.1	$ -				$ -
EG-6	Electrical Generator	0.2	$ -				$ -
EG-7	Electrical Generator	0.1	$ -				$ -
GIS	Guard Island	0.2	$ 2,000				$ 2,000
GP1	Guard Post #1	7.8	$ 78,000				$ 78,000
GP44	Clothing Issue	0.4	$ -				$ -
H	Laundry	17.3	$ 173,000				$ 173,000
HH	Isotope Separation	15.3	$ -				$ -
M	Machine/Elect Shops	56.0	$ 2,065,840	$ (2,065,840)		$ 560,000	$ 560,000
P	Power House Main Hill	15.1	$ 151,000				$ 151,000
PH	Power House	0.6	$ 6,460				$ 6,460
PS	Paint Shop	2.3	$ -				$ -
R	Research Lab	55.0	$ -				$ -

Option 3 - Cost Projections

Building ID	Description	Square Footage (X1,000)	Base Improvement Cost from Alternative 1	Base Improvement Cost Adjustment	Additional Tenant Improvements	Additional Demolition Costs	Total
SD	Sanitary Treatment (Not in Service)	1.6	$ -				$ -
SM*	Demolished Nuclear Production Building	0.0	$ -				$ -
SST	Salt Storage	0.6	$ 6,000				$ 6,000
SW	Tritium R&D	43.1	$ -				$ -
T	Nuclear Operations	173.0	$ -				$ -
W	Maintenance Shops	32.5	$ 1,115,375	$ (1,115,375)		$ 325,000	$ 325,000
WD	Radioactive Waste Treatment	16.2	$ -				$ -
	TOTAL	766.9	$ 7,752,734	$ (6,940,574)	$ -	$ 1,773,000	$ 2,585,160
Option 3 Totals		1336.1	$ 20,302,650	$ (6,940,574)	$ 5,954,160	$ 1,773,000	$ 21,089,236

Appendix 4 - Methodology and Assumptions used to Determine the Cost to Bring Buildings to a Code Compliant Condition

The cost estimates for building improvements necessary to bring the buildings to a level of code compliance required for their use as lease properties in the private market, are based upon assumptions that were drawn from a series of physical character reports provided by the Mound Administrative Contractor, EG&G, and a site walk-through of 14 selected buildings conducted by an Architect from Sasaki Associates, and Engineers from URS. Reports of individual buildings prepared by Barge, Waggoner, Sumner and Cannon, Inc. were helpful in understanding building systems and general conditions.

Comparisons were made between the reports and the observations made on the walk-through. These comparisons led to a joint conclusion that the written report data was focused on maintenance requirements for use by DOE in continuance of their mission, as opposed to requirements for private use and compliance with current standards of public safety and convenience. Of particular note, the proposed building needs did not address items such as protecting paths of egress for multi-tenant use. Additionally, building modifications that are required by code were classified as optional as opposed to mandatory.

While useful for comparative review, these reports could not be used directly for estimates for required modifications. It was necessary to develop a listing of essential elements of code compliance and assign a range of costs necessary to accomplish required modifications. Table 4-1 lists the 8 key code items and the cost range for each item. Costs ranges were based upon the Architects and Engineers experience with projects of similar nature, and from comparisons with data from the Mound Reports.

Next, the 8 items were combined into 5 groups that characterized the overall level of need improvements. The groupings had a range of total cost from $8 per square foot to $17 per square foot. They related to the type of building, anticipated occupancy, and building layout. The groupings, A through E are shown on Table 4-2.

Next, each of the buildings to remain in Option 1, the option preserving the most buildings, was assigned a cost grouping. This assignment was based upon the visit of the 14 buildings, reviews of building data available, personal familiarity of team members (Stan Abrahamson) with buildings, and extrapolations from buildings visited to buildings of similar age, use, and condition. The assignments are documented in Table 4-3. Note that because of the combinations of costs that make up each of the categories, all buildings in a category do not necessarily share off of the same details.

The costs per square foot from Table 4-3 were applied to building areas and included as part of the building cost estimate chart. To these code related costs, the additional costs for modifications to HVAC systems or code compliance, conversion of heating

and cooling systems, and an amount for accomplishing differed maintenance was added.

Table 4-1

	Assumptions and Cost Determination (per square foot)	
1.	Increase F.A. system capacity for code required horns and H.I. strobes:	$.25 to $.75
2.	Provide rated enclosures and closets for emergency power to support increased exit signage and emergency lighting:	$.50 to $1
3.	Provide accessibility signage:	$.50
4.	Provide accessible hardware (1/200 sf) including clearance relocations:	$2 to $5
5.	Modify toilet layouts, fixtures or accessories to provide accessibility:	$.50 to $1.50
6.	Upgrade elevator controls and signals to meet ADA requirements:	$2 to $4
7.	Rebuild egress stairs in older buildings to meet code requirements for treads, risers and railing dimensions:	$1 to $3
8.	Demolition costs to be added to all the above to accommodate replacement or remodeling:	$2 to $6

Table 4-2

Grouping of Improvement Costs:
Group A=$8.00: Includes item #3 plus minimum of 1, 2, 4, 5, 6 and 8.
Group B-$10.00: Includes item #3 plus minimum of 1, 2, 5 and average of 4, 6 and 8.
Group C=$12.50: Includes item #3 plus minimum of 5, 7 and average of 1, 2, 4, 6 and 8.
Group D=$14.00: Includes item #3 plus average of 1, 2, 4, 5, 6, 7 and 8.
Group E=$15.00-$17.00: Includes all items with some at their maximum.

Table 4-3
Buildings to be Reused by Improvement Cost Groupings

A	B	C	D	E
22	E	40*	A	3
28	G	61	M	27
45	GW	B	OSW	46
63		DS	W	48
85		GH		49
87		I		60
89				67
100				99 **
104				
105				
COS				
OSE				

*No elevator.

**Does not include #7.

Appendix 5 - Building Improvement Cost Projections

Introduction

Probable costs were developed to project the costs associated with reuse of the facilities. Costs were determined for facilities that are proposed for reuse in three scenarios which are described as Reuse Options. Details of the Reuse Options are provided in the body of the Development Options Report. The Reuse Options are listed below:

1. Reuse Option 1: Industrial Park
2. Reuse Option 2: Industrial and Technology Center
3. Reuse Option 3: Technology Center

Cost Projections for Fire Protection, Plumbing, Mechanical and Electrical

The cost data for fire protection, plumbing, mechanical and electrical was derived from 1994 Means Cost Data. The costs were inflated 3% per year to arrive at a 1998 basis.

A nominal average-size building was calculated from the facilities that are being considered for reuse as shown in Table 1-1. The average-size buildings are as follows:

1. Office/Administrative:	22,000 square feet
2. Light Manufacturing/Laboratory:	19,600 square feet
3. General Industry/Storage:	3,900 square feet

Reuse Option 1 - Industrial Park

In this option, costs are provided to meet minimum commercial standards/codes. Requirements to reuse the Mound facilities described as Option 1 are as follows:

1. Office/Administrative Facility requirements:
- Backflow Preventers
- Fire Alarm Strobes
- Minimal Upgrade of Exit Signage and Emergency Lighting
  Total Projected Cost of $0.50/Sq. Ft.

2. Light Manufacturing/Laboratory Facility requirements:
- Backflow Preventers
- Fire Alarm Strobes
- Minimal Upgrade of Exit Signage and Emergency Lighting
- Plug Floor Drains
  Total Projected Cost of $0.45/Sq. Ft.

3. General Industry/Storage Facility requirements:
- Backflow Preventers
- Fire Alarm Strobes
- Minimal Upgrade of Exit Signage and Emergency Lighting
- Plug Floor Drains

Total Projected Cost of $0.65/Sq. Ft.

Reuse Option 2 - Industrial and Technology Park

Major costs in this Reuse Option, above those for Option 1, are driven by the discontinuation of an on-site Fire Protection Station and by the potential to discontinue the Centralized Power Plant. Requirements to reuse the Mound facilities described as Option 2 are as follows:

1. Office/Administrative Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Additional Exit Signage and Emergency Lighting
- Provide Fire Department Water Connection Systems
- Reprogram DDC Energy Control System for Individual Units

Total Projected Cost of $1.00/Sq. Ft.

2. Light Manufacturing/Laboratory Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Additional Exit Signage and Emergency Lighting
- Plug Floor Drains
- Provide Fire Department Water Connections
- Reprogram DDC Energy Control System for Individual Units

Total Projected Cost of $0.90/Sq. Ft.

3. General Industry/Storage Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Additional Exit Signage and Emergency Lighting
- Plug Floor Drains
- Provide Fire Department Water Connections
- Reprogram DDC Energy Control System for Individual Units

Total Projected Cost of $2.40/Sq. Ft.

Reuse Option 3 - Technology Park

Major costs in this Reuse Option, above those for Option 2, are driven by the need to upgrade the facilities commensurate with a modern Technology Center. Upgrading of lighting to current standards for a technology driven application is the primary cost factor. Requirements to reuse the Mound facilities described as Option 3 are as follows:

1. Office/Administrative Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Complete Replacement of Exit Signage and Emergency Lighting
- Provide Fire Department Water Connection Systems
- Reprogram DDC Energy Control System for Individual Units
- Replace Electrical Water Coolers
- Remove Fire Hose Cabinets
- Replace Light Fixtures in Office and Administrative Areas

  Total Projected Cost of $7.05/ Sq. Ft.

2. Light Manufacturing/Laboratory Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Complete Replacement of Exit Signage and Emergency Lighting
- Plug Floor Drains
- Provide Fire Department Water Connections
- Reprogram DDC Energy Control System for Individual Units
- Replace Electric Water Coolers
- Remove Fire Hose Cabinets
- Replace Light Fixtures in Office and Laboratory Areas

  Total Projected Cost of $4.90/Sq. Ft.

3. General Industry/Storage Facility requirements:
- Backflow Preventers
- Replace Fire Alarm System
- Complete Replacement of Exit Signage and Emergency Lighting
- Plug Floor Drains
- Provide Fire Department Water Connections
- Reprogram DDC Energy Control System for Individual Units
- Remove Fire Hose Cabinets

  Total Projected Cost of $3.15/Sq. Ft.

Structural Improvements

The Mound facilities are structurally sound and do not exhibit structural defects that necessitate correction for reuse in any of the three Reuse Options. Accordingly, there are no probable costs associated with structural attributes.

Environmental Restoration

The existing DoE Exit Plan for the disposition of the Mound site (see Mound-Integrated Comprehensive Plan and related documents) calls for the environmental restoration of the site and the facilities within the site before individual buildings are disposed of through demolition or building reuse and the site is turned over to the appropriate governing body. Accordingly, no additional costs are anticipated.

Building Demolition Costs

The demolition costs for a given facility are not a function of Reuse Options. Since the site closure activities carried out by the DoE for final disposition are relatively rigorous, demolition of the buildings is straight forward. Probable costs for demolition should not be dependent on the previous use categories. Commercial cost standards suggest that the probable demolition costs will be approximately ten dollars per square foot ($10.00/sq. ft).

Decentralized HVAC Utility Plants

The feasibility of maintaining the Main Hill Central Power Plant (Building P) in the three Reuse Options and the use of decentralized systems have been examined and reported in detail in Appendix 6. Appendix 6 provides probable costs and pay-back ramifications for the three different options. In the event that the decision is made to go to decentralized systems, the cost for the same will probably be allocated to site development cost. However, it may be useful to examine the cost based upon individual facilities since the decision to reuse will usually be cost driven. Accordingly, costs for individual facilities are provided in Table 5-1.

Details of parameters required to formulate Table 5-1 are provided in Appendix 6. It should be noted that, based on first cost and future operating cost, frequently it is most efficient to cluster buildings together. This is reflected in Table 5-1 as "Decentralization Plant Designations". In addition the Reuse Options have been restricted to a group of buildings which do not include the buildings located in the SM Area that will continue to be used by the DoE. These buildings are included in Table 5-1 since any decision regarding decentralization needs to include these buildings.

Table 5-1 Summary of Decentralized HVAC Plant Costs

Decentralized Plant Designation	Building Number	Bldg. Area (K Sq. Ft.)	Probable Total Cost ($)	Average Cost ($/Sq. Ft.)
MH 1	28 60	11.3 4.0	214,170	14.00
MH 2	40 99	12.2 11.4	214,170	9.08
MH 3	48	8.0	127,160	15.90
MH 4	B	27.7	337,150	12.17
MH 5	COS	64.6	622,820	9.63
MH 6	DS	47.8	480,400	10.05
MH 7	E E-Annex	29.6 18.1	385,440	8.06
MH 8	G GW	7.5 9.8	274,505	15.87
MH 9	I	25.7	315,205	12.26
MH 10	M	56.0	696,700	12.44
MH 11	A OSE OSW	55.6 90.1 54.3	1,124,800	5.62
MH 12	W	32.5	483,290	14.87
SP 2	105	32.0	560,400	14.75
TF 1 (Heat Only)	3	12.4	81,043	6.54
TF 2 (Heat Only)	27	5.3	47,905	9.04
TF 3 (Heat Only)	35	2.5	43,800	17.52
TF 4 (Heat Only)	49	14.9	106,590	7.15
TF 5 (Heat Only)	63	16.5	106,590	6.46
TF 6 (Heat Only)	67	3.8	43,800	11.53
TF 7 (Heat Only)	87	38.8	147,290	3.79
LA 1 (Heat Only)	61	45.5	147,290	3.24
LA 2	98	8.5	97,295	11.45
LA 3 (Heat Only)	94	1.2	29,480	24.57
SP 1 (Heat Only)	102 31 22 36 37 38 39 44 GP44 50 95 101 120	11.0 8.7 8.0 4.3 2.5 44.3 3.5 2.5 0.4 14.8 2.0 1.8 0.1	325,050	3.43
Not Required	22,24,45,46,55,56,57, 81,82,83,84,85,89,95, 100,102,104,110,112, 113,GH,P,PH,SST, WH1,WH2,WH3	-	-	-

Summary of Probable Costs to Reuse the Mound Facilities

The probable facility costs required to correct the deficiencies to permit reuse of the Mound facilities are summarized in Table 5-2

Table 5-2 Summary of Probable Costs for Facility Reuse

	Probable Cost Dollars/Square Foot		
	Reuse Option 1 Industrial Park	Reuse Option 2 Industrial & Tech. Center	Reuse Option 3 Tech. Center
Fire Protection, Plumbing, Mechanical and Electrical Deficiencies			
Office/Administrative	$ 0.50	$ 1.00	$ 7.05
Light Manufacturing/Laboratory	$ 0.45	$ 0.90	$ 4.90
General Industry/ Storage	$ 0.65	$ 2.40	$ 3.15
Structural Deficiencies			
All Facility Types	$ 0.00	$ 0.00	$ 0.00
Environmental Deficiencies			
All Facility Types	N/A	N/A	N/A
Demolition Cost			
All Facility Types	$ 10.00	$ 10.00	$ 10.00

Appendix 6 - HVAC Utility Plant Assessment

Introduction

The purpose of this analysis is to determine the economical feasibility of maintaining the Main Central Plant (Building P) as the connected demand for steam and chilled water is reduced. This reduction in connected demand will occur as facilities are closed down, as the processes within the facilities are altered, and as facilities are transferred to various reuse applications. This analysis compares the costs and energy consumption aspects of new Decentralized Plants to that of the existing Central Plant.

The Mound Plant Utility Study (prepared by Barge, Waggoner, Sumner, and Cannon, Inc., dated April 15, 1996) addressed economic ramifications for various entities, i.e. DoE contractors, private contractors, MMCIC, etc., to deliver utility services to the DoE operations. The report did not address the economics of the utilization of Decentralized HVAC Plants rather than the Central Plant. Although some of the basic data which is used in this report is based on this Utility Study, this report is an entity unto its own, that is, it should not be used as a basis to validate or invalidate the Mound Plant Utility Study.

Assumptions/Estimates

Energy Demands

For the purpose of analysis, the steam and chilled water demand for all buildings to be reused under each of the Reuse Options were calculated based on the consumption rates as presented in the Mound Plant Utility Study. The costs for operating the Central Plant were also extracted from the Mound Plant Utility Study.

The heating and cooling demands for Reuse Option 1 are provided in Table 6-1. The table includes the heating and cooling requirements for the facilities in the SM-PP area which are not formally included in the Reuse Options but will be maintained by the DoE for continuing missions and eventual other disposition. In addition, the energy requirements for Building 105 include the unfinished mezzanine area which is consistent with the Mound Plant Utility Study.

Table 6-1 Heating and Cooling Demands - Reuse Option 1

Bldg. No.	Building Description	Bldg. Type	Bldg. Area (sq. ft.)	Heating Demand (BTU/hr)	Heating Demand (#Stm/yr)	Cooling Demand (BTU/hr)	Cooling Demand (Ton hrs/yr)
Main Hill Buildings							
28	Ceramic Prod.	L	11,300	650,880	1,446,400	683,650	82,490
60	Ceramic Prod	L	4,000	230,400	512,000	242,000	29,200
40	Print Ship	A	12,200	461,160	1,024,800	488,000	58,560
99	Security Ops	A	11,400	430,920	957,600	456,000	54,720
48	Surveillance	L	8,000	460,800	1,024,000	484,000	58,400
B	Adv Dev/Pro	L	27,700	1,595,520	3,545,600	1,675,850	202,210
COS	Ops Support	L	64,700	3,726,720	8,281,600	3,914,350	472,310
DS	Stds Lab	L	47,800	2,753,280	6,118,400	2,891,900	348,940
E	Adv Dev Prod	L	29,800	1,716,480	3,814,400	1,802,900	217,540
E-Annex	Offices	A	18,000	680,400	1,512,000	720,000	86,400
G	Garage	LM	7,500	580,500	1,290,000	697,500	83,250
GW	Bond Stores	LM	9,800	758,520	1,685,600	911,400	108,780
I	High Exp Prod	L	25,700	1,480,320	3,289,600	1,554,850	187,610
M	Mach Shops	LM	56,000	4,334,400	9,632,000	5,208,000	621,600
A	Admin Off.	A	55,600	2,101,680	4,670,400	2,224,000	266,880
OSE	Opns Supp	A	90,100	3,405,780	7,568,400	3,604,000	432,480
OSW	Opns Supp	A	54,300	2,052,540	4,561,200	2,172,000	260,640
W	Maint Shops	LM	32,500	2,515,500	5,590,000	3,022,500	360,750
SM-PP Buildings							
102	Office	A	11,000	415,800	924,000	440,000	52,800
31	Waste Stor	S	8,700	0	0	0	0
33	Maintenance	A	8,000	302,400	672,000	320,000	38,400
36	Support	L	4,300	247,680	550,400	260,150	31,390
37	Form Lab	L	2,500	144,000	320,000	151,250	18,250
38	Nuc Opns	L	44,300	2,551,680	5,670,400	2,680,150	323,390
39	Support	A	3,500	132,300	294,000	140,000	16,800
44	Cafeteria	A	2,500	94,500	210,000	100,000	12,000
GP44	Cloth Issue	A	400	15,120	33,600	16,000	1,920
50	Assem & Tst	L	14,800	852,480	1,894,400	895,400	108,040
95	Chiller Plant	A	2,000	75,600	168,000	80,000	9,600
101	Eng Support	A	1,800	68,040	151,200	72,000	8,640
120	Storage	S	100	0	0	0	0
105	Mach Shop	LM	38,000	2,941,200	6,536,000	3,534,000	421,800

Table 6-1 Heating and Cooling Demands - Reuse Option 1

Bldg. No.	Building Description	Bldg. Type	Bldg. Area (sq. ft.)	Heating Demand (BTU/hr)	Heating Demand (#Stm/yr)	Cooling Demand (BTU/hr)	Cooling Demand (Ton hrs/yr)
Test Fire Buildings							
3	Explos Test	L	12,400	714,240	1,587,200	750,200	90,520
27	Adv Dev	L	5,300	305,280	678,400	320,650	38,690
35	Radiography	LM	2,500	193,500	430,000	232,500	27,750
49	Timer Fab	LM	14,900	1,153,260	2,562,800	1,385,700	165,390
63	Qual/Test	LM	16,500	1,277,100	2,838,000	1,534,500	183,150
67	Energy Supp	L	3,800	218,880	486,400	229,900	27,740
87	Explos Test	L	38,900	2,240,640	4,979,200	2,353,450	283,970
Lower Area Buildings							
61	Warehouse	A	45,500	1,719,900	3,822,000	1,820,000	218,400
98	Cnt Fire Stat	A	8,500	321,300	714,000	340,000	40,800
94	Mat Capacity	L	1,200	69,120	153,600	72,600	8,760

The heating and cooling demands for Reuse Option 2 are provided as Table 6-2. The only difference between this table and the former table (Table 6-1) are the number of facilities, resultant area and heating and cooling demands.

Table 6-2 Heating and Cooling Demands - Reuse Option 2

Bldg. No.	Building Description	Bldg. Type	Bldg. Area (sq. ft.)	Heating Demand (BTU/hr)	Heating Demand (#Stm/yr)	Cooling Demand (BTU/hr)	Cooling Demand (Ton hrs/yr)
Main Hill Buildings							
28	Ceramic Prod.	L	11,300	650,880	1,446,400	683,650	82,490
60	Ceramic Prod	L	4,000	230,400	512,000	242,000	29,200
40	Print Ship	A	12,200	461,160	1,024,800	488,000	58,560
99	Security Ops	A	11,400	430,920	957,600	456,000	54,720
B	Adv Dev/Pro	L	27,700	1,595,520	3,545,600	1,675,850	202,210
COS	Ops Support	L	64,700	3,726,720	8,281,600	3,914,350	472,310
DS	Stds Lab	L	47,800	2,753,280	6,118,400	2,891,900	348,940
E	Adv Dev Prod	L	29,800	1,716,480	3,814,400	1,802,900	217,540
E-Annex	Offices	A	18,000	680,400	1,512,000	720,000	86,400
G	Garage	LM	7,500	580,500	1,290,000	697,500	83,250
GW	Bond Stores	LM	9,800	758,520	1,685,600	911,400	108,780
I	High Exp Prod	L	25,700	1,480,320	3,289,600	1,554,850	187,610
M	Mach Shops	LM	56,000	4,334,400	9,632,000	5,208,000	621,600

Table 6-2 Heating and Cooling Demands - Reuse Option 2

Bldg. No.	Building Description	Bldg. Type	Bldg. Area (sq. ft.)	Heating Demand (BTU/hr)	Heating Demand (#Stm/yr)	Cooling Demand (BTU/hr)	Cooling Demand (Ton hrs/yr)
A	Admin Off.	A	55,600	2,101,680	4,670,400	2,224,000	266,880
OSE	Opns Supp	A	90,100	3,405,780	7,568,400	3,604,000	432,480
OSW	Opns Supp	A	54,300	2,052,540	4,561,200	2,172,000	260,640
SM-PP Buildings							
102	Office	A	11,000	415,800	924,000	440,000	52,800
31	Waste Stor	S	8,700	0	0	0	0
33	Maintenance	A	8,000	302,400	672,000	320,000	38,400
36	Support	L	4,300	247,680	550,400	260,150	31,390
37	Form Lab	L	2,500	144,000	320,000	151,250	18,250
38	Nuc Opns	L	44,300	2,551,680	5,670,400	2,680,150	323,390
39	Support	A	3,500	132,300	294,000	140,000	16,800
44	Cafeteria	A	2,500	94,500	210,000	100,000	12,000
GP44	Cloth Issue	A	400	15,120	33,600	16,000	1,920
50	Assem & Tst	L	14,800	852,480	1,894,400	895,400	108,040
95	Chiller Plant	A	2,000	75,600	168,000	80,000	9,600
101	Eng Support	A	1,800	68,040	151,200	72,000	8,640
120	Storage	S	100	0	0	0	0
105	Mach Shop	LM	38,000	2,941,200	6,536,000	3,534,000	421,800
Test Fire Buildings							
3	Explos Test	L	12,400	714,240	1,587,200	750,200	90,520
35	Radiography	LM	2,500	193,500	430,000	232,500	27,750
49	Timer Fab	LM	14,900	1,153,260	2,562,800	1,385,700	165,390
63	Qual/Test	LM	16,500	1,277,100	2,838,000	1,534,500	183,150
67	Energy Supp	L	3,800	218,880	486,400	229,900	27,740
87	Explos Test	L	38,900	2,240,640	4,979,200	2,353,450	283,970
Lower Area Buildings							
61	Warehouse	A	45,500	1,719,900	3,822,000	1,820,000	218,400
94	Mat Capacity	L	1,200	69,120	153,600	72,600	8,760

The heating and cooling demands for Reuse Option 3 are provided as Table 6-3.

Table 6-3 Heating and Cooling Demands - Reuse Option 3

Bldg.	Building	Bldg.	Bldg. Area	Heating Demand		Cooling Demand	
No.	Description	Type	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)
Main Hill Buildings							
28	Ceramic Prod.	L	11,300	650,880	1,446,400	683,650	82,490
40	Print Ship	A	12,200	461,160	1,024,800	488,000	58,560
99	Security Ops	A	11,400	430,920	957,600	456,000	54,720
COS	Ops Support	L	64,700	3,726,720	8,281,600	3,914,350	472,310
DS	Stds Lab	L	47,800	2,753,280	6,118,400	2,891,900	348,940
G	Garage	LM	7,500	580,500	1,290,000	697,500	83,250
GW	Bond Stores	LM	9,800	758,520	1,685,600	911,400	108,780
I	High Exp Prod	L	25,700	1,480,320	3,289,600	1,554,850	187,610
A	Admin Off.	A	55,600	2,101,680	4,670,400	2,224,000	266,880
OSE	Opns Supp	A	90,100	3,405,780	7,568,400	3,604,000	432,480
OSW	Opns Supp	A	54,300	2,052,540	4,561,200	2,172,000	260,640
SM-PP Buildings							
102	Office	A	11,000	415,800	924,000	440,000	52,800
31	Waste Stor	S	8,700	0	0	0	0
33	Maintenance	A	8,000	302,400	672,000	320,000	38,400
36	Support	L	4,300	247,680	550,400	260,150	31,390
37	Form Lab	L	2,500	144,000	320,000	151,250	18,250
38	Nuc Opns	L	44,300	2,551,680	5,670,400	2,680,150	323,390
39	Support	A	3,500	132,300	294,000	140,000	16,800
44	Cafeteria	A	2,500	94,500	210,000	100,000	12,000
GP44	Cloth Issue	A	400	15,120	33,600	16,000	1,920
50	Assem & Tst	L	14,800	852,480	1,894,400	895,400	108,040
95	Chiller Plant	A	2,000	75,600	168,000	80,000	9,600
101	Eng Support	A	1,800	68,040	151,200	72,000	8,640
120	Storage	S	100	0	0	0	0
105	Mach Shop	LM	38,000	2,941,200	6,536,000	3,534,000	421,800
Test Fire Buildings							
3	Explos Test	L	12,400	714,240	1,587,200	750,200	90,520
35	Radiography	LM	2,500	193,500	430,000	232,500	27,750
63	Qual/Test	LM	16,500	1,277,100	2,838,000	1,534,500	183,150

Table 6-3 Heating and Cooling Demands - Reuse Option 3

Bldg.	Building	Bldg.	Bldg. Area	Heating Demand		Cooling Demand	
No.	Description	Type	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)
67	Energy Supp	L	3,800	218,880	486,400	229,900	27,740
87	Explos Test	L	38,900	2,240,640	4,979,200	2,353,450	283,970
Lower Area Buildings							
61	Warehouse	A	45,500	1,719,900	3,822,000	1,820,000	218,400
94	Mat Capacity	L	1,200	69,120	153,600	72,600	8,760

Boilers

Based on a reported steam production in 1995 of approximately 200,000,000 lbs. and fuel consumption equivalent to approximately 2,909,490 CCF of natural gas, the steam plant efficiency was calculated to be approximately 64.5 percent. This agrees with the Mound Plant Utility Study which indicates boiler efficiencies of 70 percent and line losses of five percent.

Based on manufacturer's published data, boiler efficiencies of 78 to 81 percent can be obtained for "Ohio Special" boilers operating from 25 to 100 percent load. It was assumed that an average plant efficiency of 75 percent could be obtained by the proposed Decentralized Plants.

It was estimated that the Decentralized Plants with new boilers and greatly reduced line losses could save 10 percent in energy costs related to steam production. The cost of natural gas was determined to be $0.247/CCF.

Chillers

The combined average energy consumption for the existing chillers and associated chilled water pumps and cooling tower equipment was assumed to be 1.1 kw/ton. The typical 1980's vintage chiller was manufactured to consume 0.75 kw/ton at full load and approximately 0.8 kw/ton at partial load. The 30 percent glycol solution increases kw/ton and adds significantly to the head losses which need to be accommodated by the chilled water pumps. A distribution loss due to a one-degree temperature rise equates to an eight percent system efficiency loss for a system with a 12-degree temperature difference between chilled water supply and chilled water return.

Manufacturer's data for air cooled chillers with a 30 percent glycol solution indicates an average energy consumption of 1.3 kw/ton at full load and 1.04 kw/ton at partial load conditions.

For the purpose of comparison, it was estimated that the new air cooled chillers to be used by the Decentralized Plants would operate at approximately the same energy consumption rate as the existing chillers. It is anticipated that a five percent energy savings could be realized by the Decentralized Plants due to the elimination of most of the distribution losses (temperature rise and pump head losses).

Decentralized Unit Boiler and Chiller Costs

The probable costs to provide Decentralized Plants are based on estimates from Means Mechanical Cost Data and prices from equipment manufacturers. Costs for Decentralized Plants include:

- Steam boilers and associated feed water equipment and pumps
- Steam and condensate piping to connect to existing distribution piping within the buildings.
- Air-cooled chillers and associated pumps and piping as required to connect to existing distribution piping.
- Incidental plumbing, insulation, controls, and electrical power.
- $70/sq. ft. for mechanical rooms/buildings to house boilers and associated equipment, pumps, etc.

Tables 6-4 and 6-5 provide nominal unit costs for Decentralized Boiler and Chiller Units as a function of the capacity of the respective units.

Table 6-4 Approximate Costs for Decentralized Boiler Plants

Nominal Boiler Plant Capacity	Boiler & Fittings Costs	Boiler Feed Sys. Costs	Plant Area (sq. ft.)	Building Costs	Electrical Costs	Conting. (10%)	Total Cost
3 BHP Up to 100 MBH	$7,000	$5,000	140	$9,800	$5,000	$2,680	$29,480
5 BHP Up to 200 MBH	$13,575	$6,000	150	$10,500	$6,000	$3,608	$39,683
10 BHP Up to 335 MBH	$15,550	$7,000	200	$14,000	$7,000	$4,355	$47,905
15 BHP Up to 533 MBH	$22,000	$10,000	300	$21,000	$8,000	$6,100	$67,100
25 BHP Up to 840 MBH	$24,675	$12,000	400	$28,000	$9,000	$7,368	$81,043
40 BHP Up to 1340 MBH	$28,900	$14,000	600	$42,000	$12,000	$9,690	$106,590
80 BHP Up to 2680 MBH	$42,900	$15,000	800	$56,000	$20,000	$13,390	$147,290
100 BHP Up to 3350 MBH	$60,000	$16,000	900	$63,000	$25,000	$16,400	$180,400
125 BHP Up to 4190 MBH	$74,000	$17,000	900	$63,000	$30,000	$18,400	$202,400
150 BHP Up to 5025 MBH	$84,000	$18,000	900	$63,000	$32,000	$19,700	$216,700

Table 6-4 Approximate Costs for Decentralized Boiler Plants (continued)

Nominal Boiler Plant Capacity	Boiler & Fittings Costs	Boiler Feed Sys. Costs	Plant Area (sq. ft.)	Building Costs	Electrical Costs	Conting. (10%)	Total Cost
175 BHP Up to 5860 MBH	$87,000	$19,000	1160	$81,200	$40,000	$22,720	$249,920
200 BHP Up to 6700 MBH	$90,000	$20,000	1160	$81,200	$40,000	$23,120	$254,320

Table 6-5 Approximate Costs for Decentralized Chiller Plants

	Chiller & Fittings Cost	Nominal Air Cooled Chiller Capacity	Plant Area (Sq. Ft.)	Building Costs	Electrical Costs	Contingency (10%)	Total Costs
20 ton Up to 240 MBH	$22,600	$5,650	50	$3,500	$5,000	$3,675	$40,425
30 ton Up to 360 MBH	$26,925	$8,475	50	$3,500	$6,000	$4,490	$49,390
40 ton Up to 480 MBH	$34,100	$10,000	50	$3,500	$7,000	$5,460	$60,060
60 ton Up to 720 MBH	$48,500	$12,900	50	$3,500	$9,000	$7,390	$81,290
70 Up to 840 MBH	$55,800	$12,900	50	$3,500	$12,000	$8,420	$92,620
80 ton Up to 960 MBH	$60,700	$12,900	60	$4,200	$20,000	$9,780	$107,580
90 ton Up to 1080 MBH	$64,500	$12,900	60	$4,200	$25,000	$10,660	$117,260
100 ton Up to 1200 MBH	$71,200	$15,450	80	$5,600	$30,000	$12,225	$134,475
110 ton Up to 1320 MBH	$79,400	$15,450	110	$7,700	$32,000	$13,455	$148,005
130 ton Up to 1560 MBH	$89,500	$15,450	110	$7,700	$40,000	$15,265	$167,915
150 ton Up to 1800 MBH	$102,100	$22,100	120	$8,400	$40,000	$17,260	$189,860
175 ton Up to 2100 MBH	$110,600	$22,100	120	$8,400	$50,000	$19,110	$210,210
210 ton Up to 2520 MBH	$136,000	$22,100	120	$8,400	$50,000	$21,650	$238,150

Decentralized Power Plants

In order to minimize first costs and maximize operating costs, clustering of buildings to permit service by an individual Decentralized Plant need to be examined. There are several buildings that lend themselves to clustering as shown

in the following tables. An integration of the demands as provided in Tables 6-1, 6-2, 6-3 with the cost of Decentralized Boiler and Chiller Plants yields Decentralized Plant costs shown in Tables 6-6, 6-7 and 6-8 for Reuse Options 1, 2, and 3, respectively.

Table 6-6 Decentralized Plant Cost - Reuse Option 1

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
Decentralized Plant MH 1							
28	11,300	650,880	1,446,400	683,650	82,490		
60	4,000	230,400	512,000	242,000	29,200		
Totals		881,280		925,650		$214,170	$14.00
Decentralized Plant MH 2							
40	12,200	461,160	1,024,800	488,000	58,560		
99	11,400	430,920	957,600	456,000	54,720		
Totals		892,080		892,080		$214,170	$9.08
Decentralized Plant MH 3							
48	8,000	460,800	1,024,000	484,000	58,400	$127,160	$15.90
Decentralized Plant MH 4							
B	27,700	1,595,520	3,545,600	1,675,850	202,210	$337,150	$12.17
Decentralized Plant MH 5							
COS	64,700	3,726,720	8,281,600	3,914,350	472,310	$622,820	$9.63
Decentralized Plant MH 6							
DS	47,800	2,753,280	6,118,400	2,891,900	348,940	$480,400	$10.05
Decentralized Plant 7							
E	29,800	1,716,480	3,814,400	1,802,900	217,540		
E-Annex	18,000	680,400	1,512,000	720,000	86,400		
Totals		2,396,880		2,522,900		$385,440	$8.06
Decentralized Plant MH 8							
G	7,500	580,500	1,290,000	697,500	83,250		
GW	9,800	758,520	1,685,600	911,400	108,780		
Totals		1,339,020		1,608,900		$274,505	$15.87

Table 6-6 Decentralized Plant Cost - Reuse Option 1 (continued)

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
Decentralized Plant MH 9							
I	25,700	1,480,320	3,289,600	1,554,850	187,610	$315,205	$12.26
Decentralized Plant MH 10							
M	56,000	4,334,000	9,632,000	5,208,000	621,600	$696,700	$12.44
Decentralized Plant 11							
A	55,600	2,101,690	4,670,400	2,224,000	266,880		
OSE	90,100	3,405,780	7,568,400	3,604,000	432,480		
OSW	54,300	2,052,540	4,561,200	2,172,000	260,640		
Totals		7,560,000		8,000,000		$1,124,800	$5.62
Decentralized Plant 12							
W	32,500	2,515,500	5,590,000	3,022,500	360,750	$483,290	$14.87
Decentralized Plant SP1 (Heating Only)							
102	11,000	415,800	924,000				
31	8,700	0	0				
33	8,000	302,400	672,000				
36	4,300	247,680	550,400				
37	2,500	144,000	320,000				
38	44,300	2,551,680	5,670,400				
39	3,500	132,300	294,000				
44	2,500	94,500	210,000				
GP44	400	15,120	33,600				
50	14,800	852,480	1,894,400				
95	2,000	75,600	168,000				
101	1,800	68,040	151,200				
120	100	0	0				
Totals			4,899,600			$325,050	$3.42
Decentralized Plant SP 2							
105	38,000	2,941,200	6,536,000	3,534,000	421,800	$560,400	$14.75
Decentralized Plant TF 1 (Heating Only)							
3	12,400	714,240	1,587,200			$81,043	$6.54
Decentralized Plant TF 2 (Heating Only)							
27	5,300	305,280	678,400			$47,905	$9.04

Table 6-6 Decentralized Plant Cost - Reuse Option 1 (continued)

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
Decentralized Plant TF 3 (Heating Only)							
35	2,500	193,500	430,000			$43,800	$17.52
Decentralized Plant TF 4 (Heating Only)							
49	14,900	1,153,260	2,562,800			$106,590	$7.15
Decentralized Plant TF 5 (Heating Only)							
63	16,500	1,277,100	2,838,000			$106,590	$6.46
Decentralized Plant TF 6 (Heating Only)							
67	3,800	218,880	486,400			$43,800	$11.53
Decentralized Plant TF 7 (Heating Only)							
87	38,900	2,240,640	4,979,200			$147,290	$3.79
Decentralized Plant LA 1 (Heating Only)							
61	45,500	1,719,900	3,822,000			$147,290	$3.24
Decentralized Plant LA 2							
98	8,500	321,300	714,000	340,000	40,800	$97,295	$11.45
Decentralized Plant LA 3 (Heating Only)							
94	1,200	69,120	153,600			$29,480	$24.57
Total Probable Cost for Decentralized Plants Under Reuse Option 1						$7,012,343	
Average cost $/sq. ft.							$8.26

Table 6-7 Decentralized Plant Cost - Reuse Option 2

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
Decentralized Plant MH 1							
28	11,300	650,880	1,446,400	683,650	82,490		
60	4,000	230,400	512,000	242,000	29,200		
Totals		881,280		925,650		$214,170	$14.00
Decentralized Plant MH 2							
40	12,200	461,160	1,024,800	488,000	58,560		
99	11,400	430,920	957,600	456,000	54,720		
Totals		892,080		944,000		$214,170	$9.08
Decentralized Plant MH 4							
B	27,700	1,595,520	3,545,600	1,675,850	202,210	$337,150	$12.17
Decentralized Plant MH 5							
COS	64,700	3,726,720	8,281,600	3,914,350	472,310	$622,820	$9.63
Decentralized Plant MH 6							
DS	47,800	2,753,280	6,118,400	2,891,900	348,940	$480,400	$10.05
Decentralized Plant MH 8							
G	7,500	580,500	1,290,000	697,500	83,250		
GW	9,800	758,520	1,685,600	911,400	108,780		
Totals		1,339,020		1,608,900		$274,505	$15.87
Decentralized Plant MH 9							
I	25,700	1,480,320	3,289,600	1,554,850	187,610	$315,205	$12.26
Decentralized Plant MH 10							
M	56,000	4,334,000	9,632,000	5,208,000	621,600	$696,700	$12.44
Decentralized Plant 11							
A	55,600	2,101,690	4,670,400	2,224,000	266,880		
OSE	90,100	3,405,780	7,568,400	3,604,000	432,480		
OSW	54,300	2,052,540	4,561,200	2,172,000	260,640		
Totals		7,560,000		8,000,000		$1,124,800	$5.62
Decentralized Plant SP1 (Heating Only)							
102	11,000	415,800	924,000				
31	8,700	0	0				
33	8,000	302,400	672,000				

Table 6-7 Decentralized Plant Cost - Reuse Option 2 (continued)

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
36	4,300	247,680	550,400				
37	2,500	144,000	320,000				
38	44,300	2,551,680	5,670,400				
39	3,500	132,300	294,000				
44	2,500	94,500	210,000				
GP44	400	15,120	33,600				
50	14,800	852,480	1,894,400				
95	2,000	75,600	168,000				
101	1,800	68,040	151,200				
120	100	0	0				
Totals		4,899,600				$325,050	$3.42
Decentralized Plant SP 2							
105	38,000	2,941,200	6,536,000	3,534,000	421,800	$560,400	$14.75
Decentralized Plant TF 1 (Heating Only)							
3	12,400	714,240	1,587,200			$81,043	$6.54
Decentralized Plant TF 3 (Heating Only)							
35	2,500	193,500	430,000			$43,800	$17.52
Decentralized Plant TF 4 (Heating Only)							
49	14,900	1,153,260	2,562,800			$106,590	$7.15
Decentralized Plant TF 5 (Heating Only)							
63	16,500	1,277,100	2,838,000			$106,590	$6.46
Decentralized Plant TF 6 (Heating Only)							
67	3,800	218,880	486,400			$43,800	$11.53
Decentralized Plant TF 7 (Heating Only)							
87	38,900	2,240,640	4,979,200			$147,290	$3.79
Decentralized Plant LA 1 (Heating Only)							
61	45,500	1,719,900	3,822,000			$147,290	$3.24
Decentralized Plant LA 3 (Heating Only)							
94	1,200	69,120	153,600			$29,480	$24.57
Total Probable Cost for Decentralized Plants Under Reuse Option 2						**$5,871,253**	
Average cost $/sq. ft.							**$7.77**

Table 6-8 Decentralized Plant Cost - Reuse Option 3

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
Decentralized Plant MH 1							
28	11,300	650,880	1,446,400	683,650	82,490	$214,170	$14.00
Decentralized Plant MH 2							
40	12,200	461,160	1,024,800	488,000	58,560		
99	11,400	430,920	957,600	456,000	54,720		
Totals		892,080		944,000		$214,170	$9.08
Decentralized Plant MH 5							
COS	64,700	3,726,720	8,281,600	3,914,350	472,310	$622,820	$9.63
Decentralized Plant MH 6							
DS	47,800	2,753,280	6,118,400	2,891,900	348,940	$480,400	$10.05
Decentralized Plant MH 8							
G	7,500	580,500	1,290,000	697,500	83,250		
GW	9,800	758,520	1,685,600	911,400	108,780		
Totals		1,339,020		1,608,900		$274,505	$15.87
Decentralized Plant MH 9							
I	25,700	1,480,320	3,289,600	1,554,850	187,610	$315,205	$12.26
Decentralized Plant 11							
A	55,600	2,101,690	4,670,400	2,224,000	266,880		
OSE	90,100	3,405,780	7,568,400	3,604,000	432,480		
OSW	54,300	2,052,540	4,561,200	2,172,000	260,640		
Totals		7,560,000		8,000,000		$1,124,800	$5.62
Decentralized Plant SP1 (Heating Only)							
102	11,000	415,800	924,000				
31	8,700	0	0				
33	8,000	302,400	672,000				
36	4,300	247,680	550,400				
37	2,500	144,000	320,000				
38	44,300	2,551,680	5,670,400				

Table 6-8 Decentralized Plant Cost - Reuse Option 3 (continued)

Bldg.	Bldg. Area	Heating Demand		Cooling Demand		Probable Cost of Plant	
No.	(sq. ft.)	(BTU/hr)	(#Stm/yr)	(BTU/hr)	(Ton hrs/yr)	Total $	$/sq. ft.
39	3,500	132,300	294,000				
44	2,500	94,500	210,000				
GP44	400	15,120	33,600				
50	14,800	852,480	1,894,400				
95	2,000	75,600	168,000				
101	1,800	68,040	151,200				
120	100	0	0				
Totals		4,899,600				$325,050	$3.42
Decentralized Plant SP 2							
105	38,000	2,941,200	6,536,000	3,534,000	421,800	$560,400	$14.75
Decentralized Plant TF 1 (Heating Only)							
3	12,400	714,240	1,587,200			$81,043	$6.54
Decentralized Plant TF 3 (Heating Only							
35	2,500	193,500	430,000			$43,800	$17.52
Decentralized Plant TF 5 (Heating Only)							
63	16,500	1,277,100	2,838,000			$106,590	$6.46
Decentralized Plant TF 6 (Heating Only)							
67	3,800	218,880	486,400			$43,800	$11.53
Decentralized Plant TF 7 (Heating Only)							
87	38,900	2,240,640	4,979,200			$147,290	$3.79
Decentralized Plant LA 1 (Heating Only)							
61	45,500	1,719,900	3,822,000			$147,290	$3.24
Decentralized Plant LA 3 (Heating Only)							
94	1,200	69,120	153,600			$29,480	$24.57
Total Probable Cost for Decentralized Plants Under Reuse Option 3						$4,678,976	
Average Cost $/sq. ft.							$7.16

Summary-Demand Requirements and Costs

All of the Reuse Options require significantly lower quantities of steam and chilled water than the Central Plant capacity. The demands of the three Reuse Options outlined in this study and the probable costs for the Decentralized Plants to meet these capacities are summarized below.

Table 6-9 Summary-Demand Requirements and Costs

Options	Peak Demands		Probable Cost
	Steam	Chilled Water	
Reuse Option 1	51,470 lbs/hr.	3,052 tons	$ 7,088,771
Reuse Option 2	44,433 lbs/hr.	2,521 tons	$ 5,871,253
Reuse Option 3	36,307 lbs/hr.	1,928 tons	$ 4,678,976

Operating Costs - Existing Central Plant

The estimated operating costs for the existing Central Plant (at an annual demand level similar to that experienced in 1995) and the annual demands for the three Reuse Options are provided in Table 6-10.

In the development of these estimates, it was assumed that equipment maintenance, service and testing, and direct labor were independent of delivery level. Accordingly, only purchased fuel, water and electricity costs varied.

Table 6-10 Summary Comparison of Projected Operating & Maintenance Costs - Existing Central Plant

Utility Component	Existing Central Plant (1995 Base)	Reuse Option No. 1	Reuse Option No. 2	Reuse Option No. 3
Sq. Ft. of Buildings Served	1,065,899	577,500	486,800	396,300
Annual Steam Demand (lbs./yr.)	200,000,000	102,947,600	88,866,800	72,614,400
Annual Cooling Demand (ton hrs/yr)	5,000,000	4,430,674	3,631,470	2,778,460
Steam & Condensate				
Fuel	$720,000	$370,611	$319,920	$261,412
Labor	$700,800	$700,800	$700,800	$700,800
Equipment Maintenance	$26,000	$26,000	$26,000	$26,000
Service & Testing	$15,000	$15,000	$15,000	$15,000
Water	$12,000	$6,177	$5,332	$4,357
Electricity	$79,800	$39,900	$39,900	$39,900
Subtotal	$1,553,600	$1,158,488	$1,106,952	$1,047,469
Chilled Water				
Labor	$175,200	$175,200	$175,200	$175,200
Equipment Maintenance	$27,000	$27,000	$27,000	$27,000
Service & Testing	$75,000	$75,000	$75,000	$75,000
Water	$6,000	$5,320	$4,360	$3,340
Electricity	$247,500	$219,318	$179,758	$137,534
Subtotal	$530,700	$501,838	$461,318	$418,074
Total Annual Operating & Maintenance Costs	$2,084,300	$1,660,327	$1,568,270	$1,465,542

Operating Costs - Decentralized Plants

A number of factors permit potential operating cost reduction with the Decentralized Plants. These are summarized as follows:

- A ten percent energy savings can be realized by reducing the distribution losses inherent with site distribution of steam and by providing new boiler systems with higher operating efficiencies.
- A five percent energy savings can be realized by reducing the distribution losses associated with site distribution of chilled water.

- "Ohio Special" fire tube boilers reduce operating costs by eliminating the requirement of 24-hour surveillance by a licensed boiler operator. Ohio law requires that steam boilers with heating surfaces above 358 sq. ft. be manned 24 hours a day by a licensed stationary engineer. By providing smaller boilers in Decentralized Plants, the cost of stationary engineers is eliminated.
- Other non-labor maintenance costs for the decentralized boilers and chillers such as servicing, testing, repair, glycol, etc., were assumed to be approximately equal to those associated with the Central Plant.

The estimated annual operating costs for fulfilling the demands of the three Reuse Options utilizing Decentralized Plants are provided in Table 6-11.

Table 6-11 Summary Comparison of Projected Operating & Maintenance Costs - Decentralized Plants

Utility Component	Reuse Option No. 1	Reuse Option No. 2	Reuse Option No. 3
Sq. Ft. of Buildings Served	577,500	486,800	396,300
Annual Steam Demand (lbs./yr.)	102,947,600	88,866,800	72,614,400
Annual Cooling Demand (ton hrs/yr)	4,430,674	3,631,470	2,778,460
Steam & Condensate			
Fuel	$333,550	$287,928	$235,271
Labor	$116,800	$116,800	$116,800
Equipment Maintenance	$26,000	$26,000	$26,000
Service & Testing	$15,000	$15,000	$15,000
Water	$6,177	$5,332	$4,357
Electricity	$39,900	$39,900	$39,900
Subtotal	$537,427	$490,960	$437,328
Chilled Water			
Labor	$58,400	$58,400	$58,400
Equipment Maintenance	$27,000	$27,000	$27,000
Service & Testing	$75,000	$75,000	$75,000
Water	$1,000	$1,000	$1,000
Electricity	$208,352	$170,770	$130,657
Subtotal	$369,752	$332,170	$292,057
Total Annual Operating & Maintenance Costs	$907,180	$823,130	$729,385

Operating Costs Savings Summary - Decentralized Plants

The annual operating costs savings for the Decentralized Plants over that of the existing Central Plant are summarized in Table 6-12. Based on the projected capital

costs as provided in Table 6-6; 6-7; 6-8, simple paybacks can be calculated for the three Reuse Options. These are also provided in Table 6-12.

Table 6-12 Summary of Costs Savings/Payback for Decentralized Plants

	Reuse Option No. 1	Reuse Option No. 2	Reuse Option No. 3
Energy Costs Savings	$48,027	$40,980	$33,018
Labor Costs Savings	$700,800	$700,800	$700,800
Parts, Service & Testing Costs Savings	$0	$0	$0
Make-up Water Cost Savings	$4,320	$3,360	$2,340
Total Annual O & M Costs Savings	$753,147	$745,140	$736,158
Capital Costs	$7,045,481	$5,871,253	$4,678,976
Simple Pay-Back (Years)	9.4	7.9	6.4

Unit Costs

The unit costs for steam and chilled water costs for the Central Plant and the Decentralized Plants are provided in Table 6-13 and Table 6-14, respectively. As the tables indicate, the unit costs increase as the demands decrease, and the unit costs associated with the Central Plant concept are higher than those of the Decentralized Plants.

Table 6-13 Unit Costs - Central Plant Concept

	Existing Central Plant (1995 Base)	Reuse Option No. 1	Reuse Option No. 2	Reuse Option No. 3
Sq. Ft. of Buildings Served	1,065,899	577,500	486,800	396,300
Annual Steam Demand (lbs./yr.)	2,000,000,000	102,947,600	88,866,800	72,614,400
Annual Cooling Demand (ton hrs/yr)	5,000,000	4,430,674	3,631,470	2,778,460
Unit Costs for Steam ($/lb. of steam)	$0.008	$0.011	$0.012	$0.014
Unit Costs for Chilled Water ($/ton hrs.)	$0.106	$0.113	$0.127	$0.150

Table 6-14 Unit Costs - Decentralized Plants Concept

	Reuse Option No. 1	Reuse Option No. 2	Reuse Option No. 3
Sq. Ft. of Buildings Served	577,500	486,800	396,300
Annual Steam Demand (lbs./yr.)	102,947,600	88,866,800	72,614,400
Annual Cooling Demand (ton hrs/yr)	4,430,674	3,631,470	2,778,460
Unit Costs for Steam ($/lb. of steam)	$0.009	$0.009	$0.010
Unit Costs for Chilled Water ($/ton hrs.)	$0.083	$0.091	$0.105

SM-PP Area Facility Considerations

The facilities in the SM-PP area are scheduled for continued use by the DoE . As such, they are not formally part of any of the Reuse Options. However, their energy needs were considered when evaluating the potential for Decentralized Plants.

For each option, the SM-PP buildings impose the following Central Plant connected loads and the associated Decentralized Plant costs:

Steam Demand = 5,444 lbs./hr. and 10,888,000 lbs./yr.
Chilled Water Demand = 0 (SM-PP Buildings fed from Building 95)
Decentralized Plant Costs = $325,050

Advantages of Main Hill Central Plant

The advantages of maintaining the Main Hill Central Plant include:

1. The existing 14 year old and 26 year old boilers could continue to serve the site for 10 to 15 more years. Anticipated useful life for water tube boilers is approximately 30 years.

2. The reliability of the Central Plant compared to Decentralized Plants is higher due to the higher degree of equipment redundancy.

3. The centralized equipment is easier to monitor and maintain.

4. The steam capacity for extended distribution is abundant.

Disadvantages of Maintaining Main Hill Central Plant

The disadvantages of maintaining the Main Hill Central Plant include:

1. The existing five chillers utilize refrigerants R-11 and R-500 which are no longer manufactured. The availability of these refrigerants in five to ten years cannot be accurately predicted, but it is highly probable that it will be limited. Due to the age and arrangement of the chillers, it would not be cost effective to retrofit these chillers to use environmentally acceptable refrigerants. Replacement within the next ten years is inevitable. The cost of chiller replacement (approximately $325/ton) was not considered for the cost analysis due to the condition of the existing machines and the anticipated decrease in connected chilled water demand.

2. The energy consumption for the existing chillers is high relative to newer chillers of the same type.

3. Chilled water systems with glycol do not lend themselves to site distribution concepts due to the 25% to 30% higher distribution head losses associated with glycol solutions. The existing chilled water distribution system could not be readily expanded to accommodate new buildings.

4. The boiler system efficiencies for Decentralized Plants would be significantly higher due to reduced distribution losses and higher operating efficiencies of new boilers. New buildings would likely utilize hot water boilers in lieu of steam boilers to obtain even higher system efficiencies and realize lower maintenance costs.

5. The extensive above ground site distribution systems need to be maintained for the Central Plant.

6. Direct labor costs associated with 24-hour monitoring of Central Plant equipment are estimated to be approximately three times higher than those required for the projected Decentralized Plants.

7. Installation of individual building meters for steam and chilled water and their associated costs eventually will have to be included with the Central Plant system that will serve multiple tenants.

Other Considerations

The Mound Plant Utility Study was directed to a large degree on the determination of alternatives for the DoE to most economically obtain their utilities. The most economical alternative is limited to the operational efficiencies of the existing Central Plant. The selection and management of operators for the Central Plant acceptable by the major entities, i.e. DoE and MMCIC, and potentially other entities such as the user groups, will continue to be an issue to be resolved. There are other related issues such as methodology for usage determination, charge rates, etc. that will continue to require attention. These issues, by themselves, should not be decisive factors. However, they will be precluded in the Decentralized HVAC Plant options.

Recommendation

Although the existing equipment within the Main Hill Central Plant appears to be in good operating condition, implementation of Decentralized HVAC Plants and decommissioning of the Central Plant is recommended based on maintenance and direct operating costs.

Appendix 7 - Site Infrastructure Requirements

Introduction

Site related alterations/improvements, primarily infrastructure in nature, are required in order to reuse the site in any of the three proposed scenarios. This Section reviews the site requirements and provides opinions of cost associated with fulfillment of these requirements. The Reuse Options are as follows:

1. Reuse Option 1: Industrial Park
2. Reuse Option 2: Industrial and Technology Center
3. Reuse Option 3: Technology Center

Scope

Site requirements included in this Section are:

1. Roads including Roadways and Storm Drainage
2. Parking Lots
3. Lighting including Roads and Parking Lots
4. Stormwater Detention
5. Potable Water Supply and Wastewater Disposal
6. Electric
7. Natural Gas
8. Mechanical (HVAC)
9. Demolition of Stanchion Lines

Roads (Roadways and Storm Drainage)

Assumptions

The City of Miamisburg standards are used for road widths which necessitate widening of existing roadways and construction of new roads as required. Storm drainage is estimated for all roadways.

The following assumptions were used to develop roadway costs:

- As much as possible of the existing roadway should be reused to keep costs to a minimum.
- Proposed roadways and existing roadways need to meet current City of Miamisburg standards. This will include 30-foot wide pavement with curb and gutter.
- Some existing roadways do not require reconstruction or widening if they are to be used only for emergency/delivery and non-general public access.
- Based on the above assumptions and visual inspection of the roadways, only about 1/3 of the roadways will require total reconstruction.

Basis of Cost Estimates

There are three basic roadway construction categories:

- Reconstruction - Removal of asphalt wearing surface and assumed aggregate base. Replace with aggregate base, an asphalt wearing surface, and curbing.
- Aggregate base - Milling of existing asphalt wearing surface, spot base repair, asphalt overlay, and curbing.
- Concrete base - Milling of existing asphalt wearing surface, concrete base joint repair, asphalt overlay, and curbing.

The unit costs for these roadway construction categories and storm drainage are provided in Table 7-1

Table 7-1 Unit Cost Estimates for Roadway Construction

No.	Component Description	Qty/Ft	Units	Unit Price ($/Unit)	Total Cost ($/L.F.)
New Construction and Reconstruction 30 Feet Wide					
1	1-1/2" 404, AC-20	0.14	CY	54.00	7.50
2	Tack Coat, 0.5 GAL/SY, 407	2	GAL	0.72	1.44
3	1-1/2" 403, AC-20	0.14	CY	54.00	7.50
4	Prime Coat, 0.5 GAL/SY, 408	2	GAL	0.99	1.98
5	8", 304	0.74	CY	21.60	16.00
6	Subgrade Comp., 203	3.33	SY	0.77	2.55
7	Curb, Type 6, 609	2	LF	9.45	18.90
8	Excav. incl. Emb., 12" Depth, 203	1.11	CY	7.65	8.50
	Total Cost Per L.F.:				**$ 64.37**
Asphalt Mill/Overlay 30 Feet Wide					
1	1.5" Wearing Course Rem'd, 202	3.33	SY	1.49	4.95
2	1-1/2", AC-20, 404	0.14	CY	54.00	7.50
3	Excav. incl. Emb., 12" depth, 203	0.44	CY	7.65	3.40
4	Curb, Type 6, 609	2	LF	9.45	18.90
5	Subgrade comp., 203	1.33	SY	0.77	1.02
6	Tack Coat, 0.5 GAL/SY, 407	2	GAL	0.72	1.44
7	1-1/2", AC-20, 403	0.06	CY	54.00	3.00
8	Prime Coat, 0.5 GAL/SY, 408	1	GAL	0.99	0.99
9	8", 304	0.30	CY	21.60	6.40
	Total Cost Per L.F.:				**$ 47.60**

Table 7-1 Unit Cost Estimates for Roadway Construction (Continued)

No.	Component Description	Qty/Ft	Units	Unit Price ($/Unit)	Total Cost ($/L.F.)
Asphalt Mill/Joint Repair/Asphalt Overlay 30 Feet Wide					
1	Asphalt Mill/Overlay				47.60
2	Concrete Base Joint Repair	0.05	Joints	293.49	14.67
	Total Cost Per L.F.:				**$62.27**
Storm Drainage Cost Per L.F.					$100.00
	Total Cost Per L.F.:				**$100.00**

Cost Estimates for Roadway and Storm Drainage

The required roadway and associated storm drainage for the three Reuse Options are illustrated in Figures 7-1, 7-2 and 7-3. Based on the unit costs provided in Table 7-1 and the takeoff of the lengths of roadway, costs estimates are provided in Table 7-2.

Table 7-2 Roadway and Storm Drainage Costs

		Unit Cost ($)		Total Cost ($)	
Type of Repair or Construction Required	Length (feet)	Roadway	Storm Drainage	Roadway	Storm Drainage
Reuse Option 1					
New Construction	500	64.37	100	32,185	50,000
Reconstruction	4950	64.37	100	318,632	495,000
Asphalt/Mill	5500	47.60	100	261,800	550,000
Asphalt/Mill/Joint Repair	5700	62.27	100	354,965	570,000
TOTAL	$16,650			$967,581	$1,665,000
BUDGET TOTAL				**$975,000**	**$1,750,000**

Table 7-2 Roadway and Storm Drainage Costs (Continued)

		Unit Cost ($)		Total Cost ($)	
Type of Repair or Construction Required	**Length (feet)**	**Roadway**	**Storm Drainage**	**Roadway**	**Storm Drainage**
Reuse Option 2					
New Construction	1250	64.37	100	80,463	125,000
Reconstruction	8050	64.37	100	518,179	805,000
Asphalt/Mill	5900	47.60	100	280,840	590,000
Asphalt/Mill/Joint Repair	6200	62.27	100	386,102	620,000
TOTAL	21,400			$1,265,583	$2,140,000
BUDGET TOTAL				**$1,275,000**	**$2,150,000**
Reuse Option 3					
New Construction	7600	64.37	100	489,212	760,000
Reconstruction	9100	64.37	100	585,767	910,000
Asphalt/Mill	4650	47.60	100	221,340	465,000
Asphalt/Mill/Joint Repair	1750	62.27	100	108,980	175,000
TOTAL	23,100			$ 1,405,299	$2,310,000
BUDGET TOTAL				**$ 1,400,000**	**$2,325,000**

Parking Lots

Assumptions

The following assumptions were used to develop parking requirements for the three Reuse Options:

- City of Miamisburg requirements for the number of parking spaces are based upon facility usable floor space area. The functional use of the facilities in each Reuse Option can yield different usable floor space. Accordingly, the use of gross floor areas throughout the development of options will be rather conservative and provide an added contingency factor.
- New developments in Miamisburg usually require separate parking lots for each building. For the Reuse Options, shared parking will be assumed which may necessitate a variance from the Board of Appeals.
- Miamisburg requires 1 space /2,000 square feet of usable floor space for Industrial use and 1 space/300 square feet of usable floor space for Professional Office use.
- Due to the uncertainty of the final usage in the three Reuse Options, three contingency factors will be used--20%, 60%, and 100% for Reuse Options 1, 2, and 3, respectively.

Based upon these assumptions, the estimated number of parking spaces required are provided in Table 7-3.

Table 7-3 Estimated Number of Parking Spaces Required

Reuse Option	Space Type	Bldg. Gross Sq. Ft. x 1000			Required Parking Spaces		
		Existing	Proposed	Total	Required	Contingency	Totals
1	Industrial	556	0	556	278	56	334
	Prof. Office	246	0	246	821	164	985
Total							1319
2	Industrial	447	0	447	224	134	358
	Prof. Office	235	0	235	784	470	1254
Total							1612
3	Industrial	340	660	1000	500	500	1000
	Prof. Office	235	147	382	1275	1275	2550
Total							3550

Basis of Cost Estimates

The cost of parking lots for this study is determined from a nominal 145 space lot with an average 300 gross square feet per parking space. Thus, the 145 spaces require 43,500 square feet of surface area. The unit costs for parking lots of a nominal 43,500 square feet are provided in Table 7-4.

Table 7-4 Unit Costs for Asphalt Parking Lots[a]

Description	Quantity	Unit Cost ($)	Cost ($)
1 1/2 " Asphalt Wearing Course (AC 20)	202 CY	54.00	10,908
Tack Coat (0.5 GAL/SY)	2420 GAL	0.72	1,743
1 1/2" Base Course (AC 20)	202 CY	54	10,908
6" Aggregate Base	807 CY	22	17,754
Subgrade Comp.	4840 SY	0.77	3,727
Excavation including Embankment (assume 9' depth), Storm Drainage	1210 CY	8.00	9,680
CB 2-2-B (Assume 4)	4 EA	720	2,880
MH No. 3	2 EA	1800	3,600
12" Conduit, Type B	1200 FT	40	48,000
Incidentals (Stop Blocks, Strip, etc.)	-	-	3,000
TOTAL			**112,200**
Average Area (Sq. Ft.)	43,500		
Average Cost per Sq. Ft.			$2.58

[a] **Assume no landscaping, curbs, underdrains, or access controls.**

Cost Estimates

Based on the parking areas provided in Table 7-3 and the unit costs from Table 7-4, the costs for the three Reuse Options are provided below as Table 7-5.

Table 7-5 Costs for Parking Lots

	Reuse Option 1	Reuse Option 2	Reuse Option 3
Total Spaces Required	1,319	1,612	3,500
Parking Area (Sq. Ft. x 1000)	396	484	1,050
Unit Cost ($/Sq. Ft.)	$ 2.58	$ 2.58	$ 2.58
Parking Lots Total Cost	**$1,021,680**	**$1,248,720**	**$2,709,000**
BUDGET TOTAL	**$1,025,000**	**$1,250,000**	**$2,750,000**

Lighting (Roads, Parking Lots, and Site)

Assumptions and Basis of Cost Estimates

The following assumptions were used to develop lighting requirements for roads and parking lots:

- Ohio Department of Transportation (ODOT) type street and parking lot lighting will be used--minimum requirements of 1 candle for roadways and 1/2 candle for parking lots.
- Based on recent experience in Montgomery County, the average cost of lighting for a 40-foot wide roadway is $31.40 per linear foot or $0.80 per square foot.
- For parking lots at 1/2 candle, an assumed cost of $0.40 per square foot rounded to $0.50 (for additional engineering, light stanchions, etc.) was used.
- Internal site lighting (walkways, yards, etc.) is assumed to be the same level as for parking lots. It also is assumed that the square foot area of internal lighting required will be the same as parking.
- Total lengths of roadway in feet are 16,650, 21,400, and 23,100 for Reuse Options 1, 2 and 3, respectively.
- The areas of parking lots (in 1000 sq. ft.) are 396, 484, and 1,050 for Reuse Options 1, 2 and 3, respectively.

Cost Estimates

Based on the above assumptions, roadway, parking and site lighting costs are provided in Table 7-6.

Table 7-6 Lighting Costs for Roadways, Parking Lots and Site

	Reuse Option 1	Reuse Option 2	Reuse Option 3
Roadways			
Length (Ft. x 1000)	16.6	21.4	23.1
Cost (@ $31.40/Ft.)	$523,300	$672,000	$725,000
BUDGET TOTAL	**$525,000**	**$675,000**	**$725,000**
Parking Lots			
Area (Sq. Ft. x 1000)	400	500	1,050
Cost (@ $0.50/Sq. Ft.)	$200,000	$250,000	$525,000
Internal Site			
Area (Sq. Ft. x 1000)	400	500	1,050
Cost (@ $0.50/Sq. Ft.)	$200,000	$250,000	$525,000
BUDGET TOTAL	**$400,000**	**$500,000**	**$1,050,000**

Stormwater Detention

Introduction

Stormwater runoff detention/retention will be a critical issue as site development continues. As with all development, runoff from the developed site must not exceed the runoff that existed prior to current construction. The entire site operates under an EPA National Pollution Discharge Elimination System (NPDES) Permit that is due to be updated during 1996.

There are two existing detention basins on the Mound property. One is a small holding pond near the entrance to the site. It is a concrete lined, fenced-in basin that collects stormwater runoff from the section of the site currently being used by the DoE (Building SM, etal.). Under normal conditions, no stormwater is detained in this basin as the outlet gate is kept open. The gate is designed to be closed and the basin used as an emergency holding pond in case of a hazardous material spill and/or runoff contamination.

The second is primatily a settling pond that is part of a system designed to control runoff and allow for the testing and monitoring of all collected site runoff. This lower system, located in the southwest corner of the existing developed site, receives all of the stormwater collected from the developed site including discharge from the upper holding pond. Under normal conditions, runoff is allowed to flow through sluice gates and holding tanks to be tested for contaminants and monitored for off-site flow rates. During significant storms, the runoff is diverted to the settling pond. The pond has a design capacity of approximately 3.1 million gallons and is equipped with an overflow alarm system.

Assumptions and Basis of Cost Estimates

When calculating the required stormwater detention volumes and opinions of probable construction costs for the three Reuse Options, the following assumptions were made:

- First and most critical was the decision to assume that the existing two ponds would not be considered as useful for future detention. The upper holding pond must remain as is if it is to continue to function as an emergency containment system for hazardous material spills. The drainage area already being serviced by this pond was taken out of the calculations for the rest of the site. The lower pond is, according to Mound staff, already at or under capacity for the existing site. Additionally, since it is a retention/settling basin, most of its storage capacity is already permanently in use.

- Given the size of the site, the Rational Method was used to calculate the peak rate of runoff for the design storm and the volume of storage required. Per the City of Miamisburg, a 10-year frequency storm was used for the design storm. A "C" value of 0.4 was used for the non-developed areas due to the steep slopes. To calculate the volume of storage required, the duration of the storm was assumed to be equal to the time of concentration for these preliminary calculations.
- Parts of the drainage basin areas extend outside the site. These areas are relatively small and were included in the total area calculations but not considered for calculation of a composite "C" value.
- To determine the approximate surface area that the proposed detention basins will require, a "unit" pond was calculated by using a 1' section of a pond with the following dimensions: 50' bottom width, 10' depth, and 1:1 side slopes. Based on this "unit" pond, every 0.31 cubic yard (CY) of storage will require 1 square foot (SF) of surface area.
- Based on experience, the control structure for each detention basin area will cost in the range of $45,000 to $85,000 to construct. Excavation/grading was estimated to cost $10.40/CY.

Requirements and Cost Estimates

Using the above assumptions, methodology, and costs, the detention requirements for each of the Reuse Options were calculated and are summarized in Table 7-7. Option 1 will require only one new basin, Option 2 will require two basins, and Option 3 will require three basins. To assist in planning and site layout, an approximate area requirement for each of the basins is calculated based on the "unit" pond discussed in the fourth Assumption. The table lists probable construction costs for each of the new basins and provides a total cost for each Reuse Option.

Table 7-7 Stormwater Detention Requirements and Estimated Costs

Reuse Option	New Basin	Detention Capacity Req'd (CY)	Approx. Area Req'd (SF)	Excavation/ Grading Costs	Control Structure Costs	Total Cost Per Basin	Total Reuse Option Cost
1	A	13,940	45,770	$145,000	$80,000	$225,000	**$225,000**
2	A	14,370	45,120	$149,500	$75,000	$224,500	
2	B	530	1,670	$5,500	$45,000	$50,500	**$275,000**
3	A	15,390	48,320	$160,000	$80,000	$240,000	
3	B	530	1,670	$5,500	$45,000	$50,500	
3	C	4760	14,950	$49,500	$80,000	$134,500	**$425,000**

Water Supply/Wastewater Disposal

Assumptions

In order to minimize costs, the Mound's existing potable water and wastewater treatment capabilities will be used with necessary upgrades to meet current standards. Schematic drawings of the site Potable Water and Sanitary Sewer Systems are provided in Figures 7-4 and 7-5, respectively.

Assumptions for potable water are:

- The existing SM/PP water tower can continue to be used and connected to the City of Miamisburg's water distribution system in its medium pressure district.
- It is assumed that the City's water treatment plant will be expanded commensurate with additional water requirements.
- A new water line will be added to serve the south end of the site and connected to an existing 12-inch water main (required only for Reuse Option 3).
- The Mound water wells can be used to provide water for fire protection. The pumps and storage tank for fire protection will be maintained.

The following assumptions relate to wastewater:

- Wastewater flow estimates were developed on the basis of four categories of facility reuse: Office, Laboratory, Light Industrial and Storage.
- The existing Wastewater Plant will be utilized but will be limited to applications on the north end of the site.
- The Miamisburg wastewater system is assumed to be used for expansion of the south end of the site.
- The Miamisburg wastewater pump stations can be expanded if necessary.

Requirements and Cost Estimates

Using the above assumptions and methodology requirements, associated costs for the three Reuse Options were calculated and are summarized in Tables 7-8, 7-9 and 7-10.

Table 7-8 Water and Wastewater Estimated Costs
Reuse Option 1

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
TOTAL			**$675,000**
Wastewater			
No Requirements			

Table 7-9 Water and Wastewater Estimated Costs
Reuse Option 2

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
Subtotal			**$675,000**
Wastewater **North Site Additions**			
8" Sanitary Sewer	1,800 LF	$60	$108,000
Manholes	5 Each	$2,500	$12,500
Engineering, Design, Etc.	Lump	$29,500	$29,500
Subtotal			**$150,000**
TOTAL			**$825,000**

Table 7-10 Water and Wastewater Estimated Costs
Reuse Option 3

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
Subtotal			**$675,000**
Wastewater **North Site Additions**			
8" Sanitary Sewer	1,800 LF	$60	$108,000
Manholes	5 Each	$2,500	$12,500
Engineering, Design, Etc.	Lump	$29,500	$29,500
Subtotal			**$150,000**
Water **South Site Additions**			
8" Water Line	4,800 LF	$75	$360,000
Hydrants	10 Each	$2,500	$25,000
4" Service Lines	2,000 LF	$25	$50,000
Meters	14 Each	$2,500	$35,000
Back Flow Preventers	14 Each	$2,500	$35,000
Inspections	14 Each	$250	$3,500
City Water Treatment Plant Expansion	0.075 MGD	$2/Gal	$150,000
Engineering, Design, Etc.	Lump	$196,500	$196,500
Subtotal			**$855,000**
Wastewater **South Site Additions**			
6" Sanitary Sewer Laterals	2,000 LF	$40	$80,000
8" Sanitary Sewer	4,800 LF	$60	$288,000
Manholes	14 Each	$2,500	$35,000
Saxony Road Pump Station Expansion	0.05 MGD	Lump	$50,000
City Wastewater Treat Plt Expansion	0.05 MGD	$3/Gal	$150,000
Engineering, Design, Etc.	Lump	$67,000	$67,000
Subtotal			**$670,000**
TOTAL			**$2,350,000**

Electric

Asumptions

It is assumed that DP&L will take possession of the site distribution system. The cost estimates provided herein are assumed to be total system upgrade, some of which may be assumed by DP&L. Upgrade/modifications for all Reuse Options include:

- Modification of existing substations/transformers
- Providing new pad mounted transformers
- Modification of existing duct bank
- Installation of DP&L provided meters and current transformers
- Modification of existing duct bank
- Installation/modification of miscellaneous wire, cable and conduit

Reuse Options 2 and 3 include the installation/upgrade of additional state-of-the-art communications network required for operation of a Technology Center.

Reuse Option 3 includes additional communications network and relocation of the overhead electric services to underground duct banks.

Basis of Cost Estimates

- Pad-mounted transformers were sized to meet the need of the specific facilities they serve. Costs were estimated using standard costs.
- Modification of the existing substations and installation of meters were estimated based on experience.
- Miscellaneous costs for conduit, duct bank, etc. are preliminary estimates without firm basis.
- Similarly, costs for modification of the existing communications network and the acquisition of state-of-the-art communication capabilities are preliminary estimates and not well validated.
- Burial of up to 10,000 linear feet of electrical and communications conduit may be required in Reuse Option 3. Normally, this cost is approximately $25.00 per linear foot. Due to the uncertainties in the geological attributes of the soil and the potential restrictions of specific geographic areas which were contaminated, the estimated cost is doubled.

Cost Estimates

The estimated costs for electric are provided in Table 7-11

Table 7-11 Cost for Electric

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Pad Mount Transform. (39)	525	525	525
Mod. Exist Substations (12) and Install 56 Meters	75	75	75
Misc. Conduit/Cable Upgrade	100	100	100
Pull Lines, Duct Bank Mod.	250	250	250
Existing Commun. Upgrade	50	50	50
State-of-the-Art Communications Network	-	500	750
Burial of Electric and Communications	-	-	500
TOTAL	1000	1500	2250

Natural Gas

Assumptions

The relocation of the natural gas distribution systems will take place if the Central Utility Plant is closed down, Decentralized HVAC Utility Plants are utilized, and the overhead utility distributions are eliminated. Details for the relocation of the distribution system are difficult to project with any degree of certainty without more extensive analysis of physical conditions, such as geological attributes and more detailed design. Accordingly, costs for natural gas are estimated per building. A conservative cost estimate of $10,000 per building is used. This includes cost for relocation of the distribution systems, metering, and installation to required boilers.

5-2.7.2 Cost Estimates

The cost for natural gas is provided in Table 7-12.

Table 7-12 Cost for Natural Gas

	Reuse Option 1	Reuse Option 2	Reuse Option 3
No. of Buildings Served	40	30	50
Total Cost (@ $10,000/ Bldg.)	$ 400,000	$ 300,000	$ 500,000

Mechanical (HVAC)

Assumptions and Cost Estimates

HVAC Utility Plants, Appendix 6, provides a detailed analysis and cost ramifications for the replacement of the Central Utility Plant with Decentralized HVAC Utility Plants. If elected to be pursued, conversion to Decentralized Units will be evaluated and costs provided on an individual building basis. This was discussed in Section 3. For completeness, the total cost is repeated here on a Reuse Option basis rather than a Building basis as provided in Appendix 6.

Table 7-13 Costs for Decentralized HVAC Plants

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Total Decentralized Plants	$7,088	$5,871	$4,678

Demolition of Stanchion Lines

Assumptions

In the event the Central Power Plant (Building P) is discontinued and individual Decentralized HVAC Plants are installed, the utility stanchions should be removed.

- It is estimated that it will require two craftsmen two days (32 hours total) to remove a stanchion.
- Assumed Cost $25.00/hour or $800.00/stanchion

Cost Estimates

The cost of removal of the stanchions is independent of the Reuse Options. Based on a nominal 50 stanchions, the cost is as follows.

Table 7-14 Cost for Stanchion Line Demolition

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Stanchion Line Demolition	$400	$400	$400

Summary of Site Infrastructure Costs

The site related costs delineated above are summarized in Table 7-15.

Table 7-15 Summary of Site Infrastructure Costs

Details in Section	Item	Cost ($ x 1000)		
		Reuse Option 1	Reuse Option 2	Reuse Option 3
5-2.1.3	Roadways	975	1275	1400
5-2.3.2	Roadway Lighting	525	675	725
5-2.2.3	Parking Lots	1025	1250	2750
5-2.3.2	Parking Lot and Site Lighting	400	500	1050
5-2.4.3	Stormwater Detention	225	275	425
5-2.1.3	Stormwater Drainage	1750	2150	2325
5-2.5.2	Water and Wastewater	675	825	2350
5-2.6.3	Electric	1000	1500	2250
5-2.7.2	Natural Gas	400	300	500
5-2.8.1	Mechanical (HVAC)	7088	5871	4678
5-2.9.2	Stanchion Demolition	400	400	400

Appendix 7 - Site Infrastructure Requirements

Introduction

Site related alterations/improvements, primarily infrastructure in nature, are required in order to reuse the site in any of the three proposed scenarios. This Section reviews the site requirements and provides opinions of cost associated with fulfillment of these requirements. The Reuse Options are as follows:

1. Reuse Option 1: Industrial Park
2. Reuse Option 2: Industrial and Technology Center
3. Reuse Option 3: Technology Center

Scope

Site requirements included in this Section are:

1. Roads including Roadways and Storm Drainage
2. Parking Lots
3. Lighting including Roads and Parking Lots
4. Stormwater Detention
5. Potable Water Supply and Wastewater Disposal
6. Electric
7. Natural Gas
8. Mechanical (HVAC)
9. Demolition of Stanchion Lines

Roads (Roadways and Storm Drainage)

Assumptions

The City of Miamisburg standards are used for road widths which necessitate widening of existing roadways and construction of new roads as required. Storm drainage is estimated for all roadways.

The following assumptions were used to develop roadway costs:

- As much as possible of the existing roadway should be reused to keep costs to a minimum.
- Proposed roadways and existing roadways need to meet current City of Miamisburg standards. This will include 30-foot wide pavement with curb and gutter.
- Some existing roadways do not require reconstruction or widening if they are to be used only for emergency/delivery and non-general public access.
- Based on the above assumptions and visual inspection of the roadways, only about 1/3 of the roadways will require total reconstruction.

Basis of Cost Estimates

There are three basic roadway construction categories:

- Reconstruction - Removal of asphalt wearing surface and assumed aggregate base. Replace with aggregate base, an asphalt wearing surface, and curbing.
- Aggregate base - Milling of existing asphalt wearing surface, spot base repair, asphalt overlay, and curbing.
- Concrete base - Milling of existing asphalt wearing surface, concrete base joint repair, asphalt overlay, and curbing.

The unit costs for these roadway construction categories and storm drainage are provided in Table 7-1

Table 7-1 Unit Cost Estimates for Roadway Construction

No.	Component Description	Qty/Ft	Units	Unit Price ($/Unit)	Total Cost ($/L.F.)
New Construction and Reconstruction 30 Feet Wide					
1	1-1/2" 404, AC-20	0.14	CY	54.00	7.50
2	Tack Coat, 0.5 GAL/SY, 407	2	GAL	0.72	1.44
3	1-1/2" 403, AC-20	0.14	CY	54.00	7.50
4	Prime Coat, 0.5 GAL/SY, 408	2	GAL	0.99	1.98
5	8", 304	0.74	CY	21.60	16.00
6	Subgrade Comp., 203	3.33	SY	0.77	2.55
7	Curb, Type 6, 609	2	LF	9.45	18.90
8	Excav. incl. Emb., 12" Depth, 203	1.11	CY	7.65	8.50
	Total Cost Per L.F.:				**$ 64.37**
Asphalt Mill/Overlay 30 Feet Wide					
1	1.5" Wearing Course Rem'd, 202	3.33	SY	1.49	4.95
2	1-1/2", AC-20, 404	0.14	CY	54.00	7.50
3	Excav. incl. Emb., 12" depth, 203	0.44	CY	7.65	3.40
4	Curb, Type 6, 609	2	LF	9.45	18.90
5	Subgrade comp., 203	1.33	SY	0.77	1.02
6	Tack Coat, 0.5 GAL/SY, 407	2	GAL	0.72	1.44
7	1-1/2", AC-20, 403	0.06	CY	54.00	3.00
8	Prime Coat, 0.5 GAL/SY, 408	1	GAL	0.99	0.99
9	8", 304	0.30	CY	21.60	6.40
	Total Cost Per L.F.:				**$ 47.60**

Table 7-1 Unit Cost Estimates for Roadway Construction (Continued)

No.	Component Description	Qty/Ft	Units	Unit Price ($/Unit)	Total Cost ($/L.F.)
Asphalt Mill/Joint Repair/Asphalt Overlay 30 Feet Wide					
1	Asphalt Mill/Overlay				47.60
2	Concrete Base Joint Repair	0.05	Joints	293.49	14.67
	Total Cost Per L.F.:				**$62.27**
Storm Drainage Cost Per L.F.					$100.00
	Total Cost Per L.F.:				**$100.00**

Cost Estimates for Roadway and Storm Drainage

The required roadway and associated storm drainage for the three Reuse Options are illustrated in Figures 7-1, 7-2 and 7-3. Based on the unit costs provided in Table 7-1 and the takeoff of the lengths of roadway, costs estimates are provided in Table 7-2.

Table 7-2 Roadway and Storm Drainage Costs

		Unit Cost ($)		Total Cost ($)	
Type of Repair or Construction Required	**Length (feet)**	**Roadway**	**Storm Drainage**	**Roadway**	**Storm Drainage**
Reuse Option 1					
New Construction	500	64.37	100	32,185	50,000
Reconstruction	4950	64.37	100	318,632	495,000
Asphalt/Mill	5500	47.60	100	261,800	550,000
Asphalt/Mill/Joint Repair	5700	62.27	100	354,965	570,000
TOTAL	$16,650			$967,581	$1,665,000
BUDGET TOTAL				**$975,000**	**$1,750,000**

Table 7-2 Roadway and Storm Drainage Costs (Continued)

		Unit Cost ($)		Total Cost ($)	
Type of Repair or Construction Required	**Length (feet)**	**Roadway**	**Storm Drainage**	**Roadway**	**Storm Drainage**
Reuse Option 2					
New Construction	1250	64.37	100	80,463	125,000
Reconstruction	8050	64.37	100	518,179	805,000
Asphalt/Mill	5900	47.60	100	280,840	590,000
Asphalt/Mill/Joint Repair	6200	62.27	100	386,102	620,000
TOTAL	21,400			$1,265,583	$2,140,000
BUDGET TOTAL				**$1,275,000**	**$2,150,000**
Reuse Option 3					
New Construction	7600	64.37	100	489,212	760,000
Reconstruction	9100	64.37	100	585,767	910,000
Asphalt/Mill	4650	47.60	100	221,340	465,000
Asphalt/Mill/Joint Repair	1750	62.27	100	108,980	175,000
TOTAL	23,100			$ 1,405,299	$2,310,000
BUDGET TOTAL				**$ 1,400,000**	**$2,325,000**

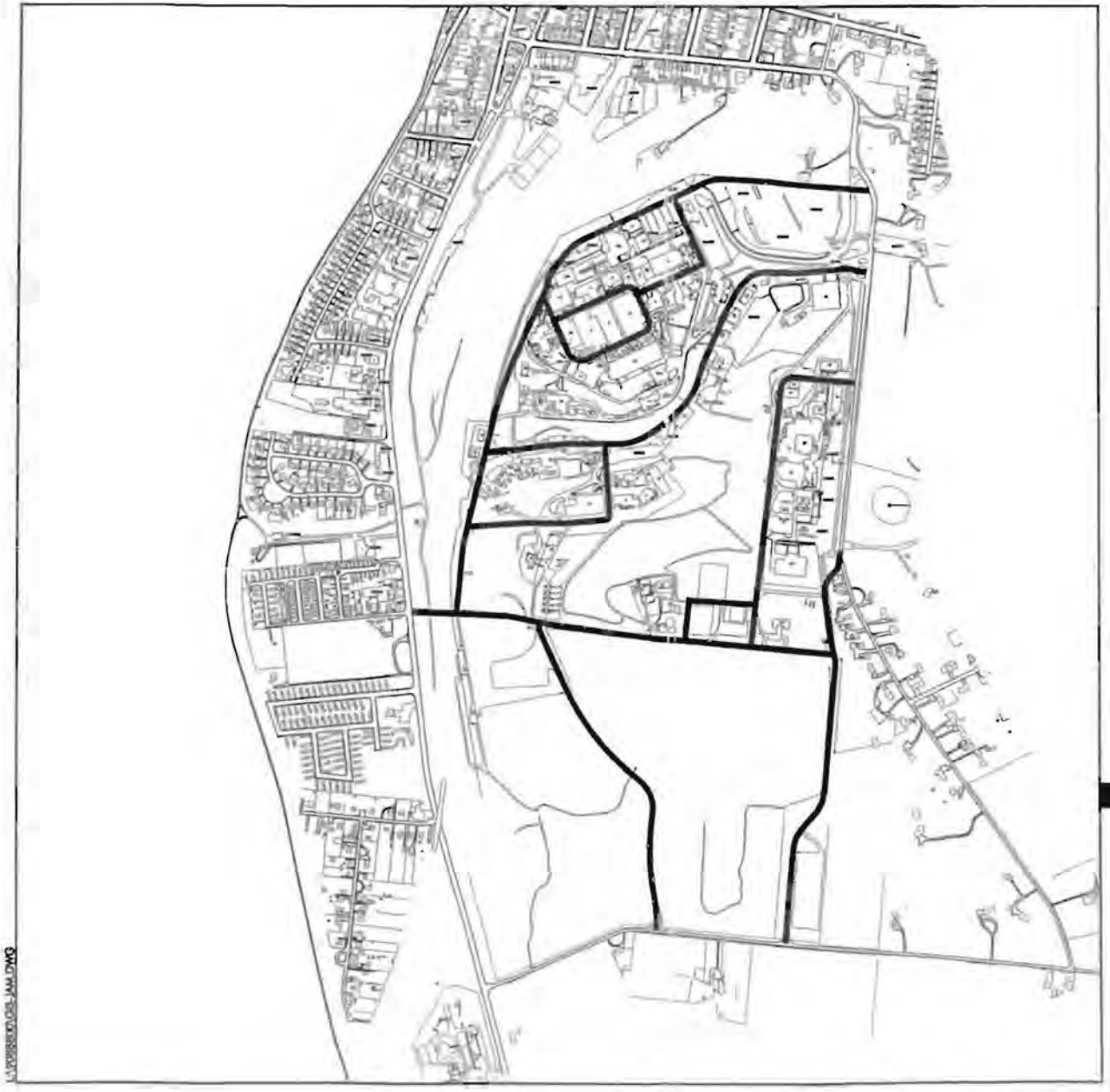

Figure 7-3

Roadway Improvements Option #3

Legend

Public Right-of-Ways

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

August 1996

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

0 375 750 1125

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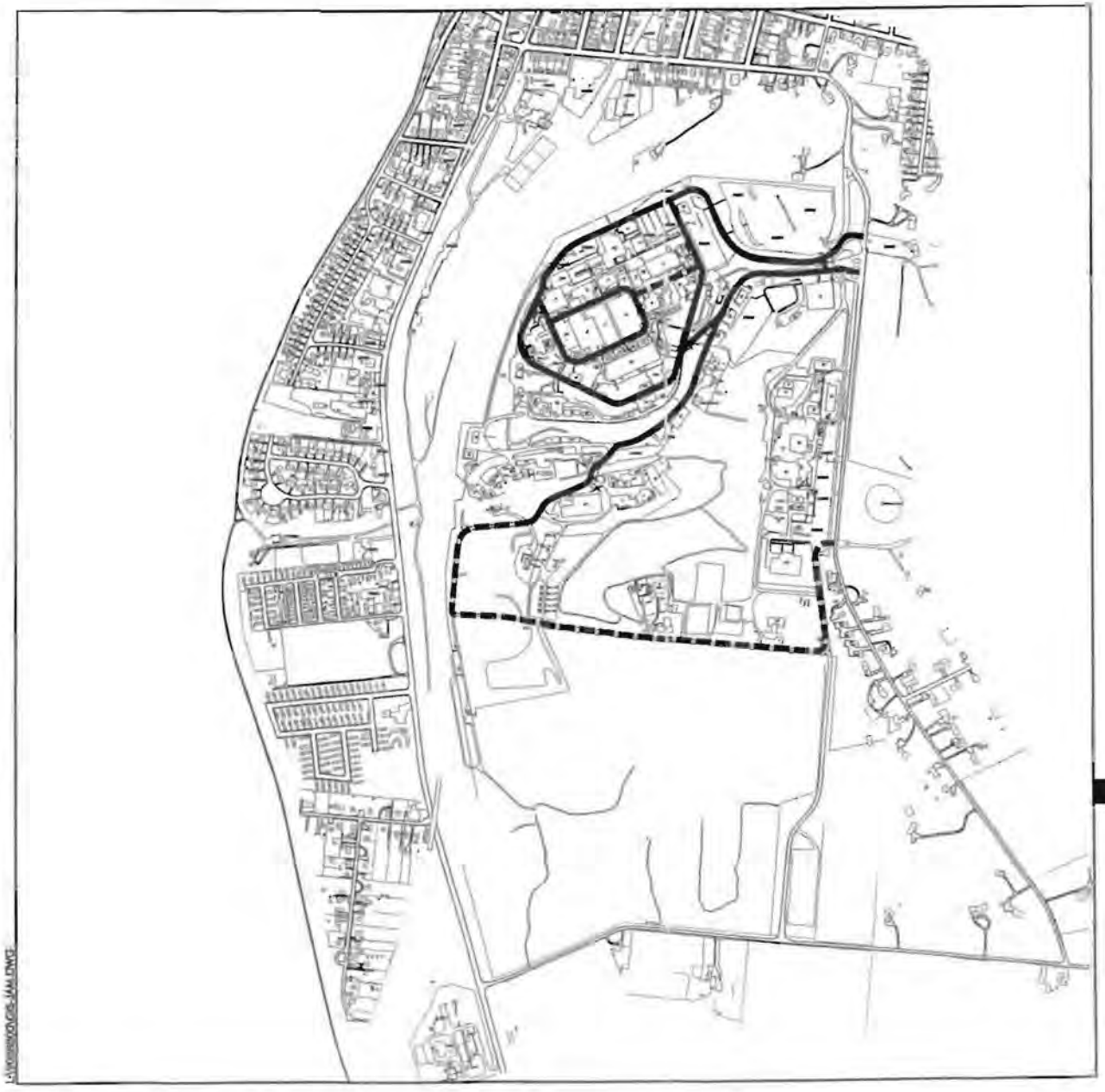

Figure 7-1

Roadway Improvements Option #1

Legend

Public Right-of-Ways

Access Roads
(Restricted to General Public)

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

August 1996

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

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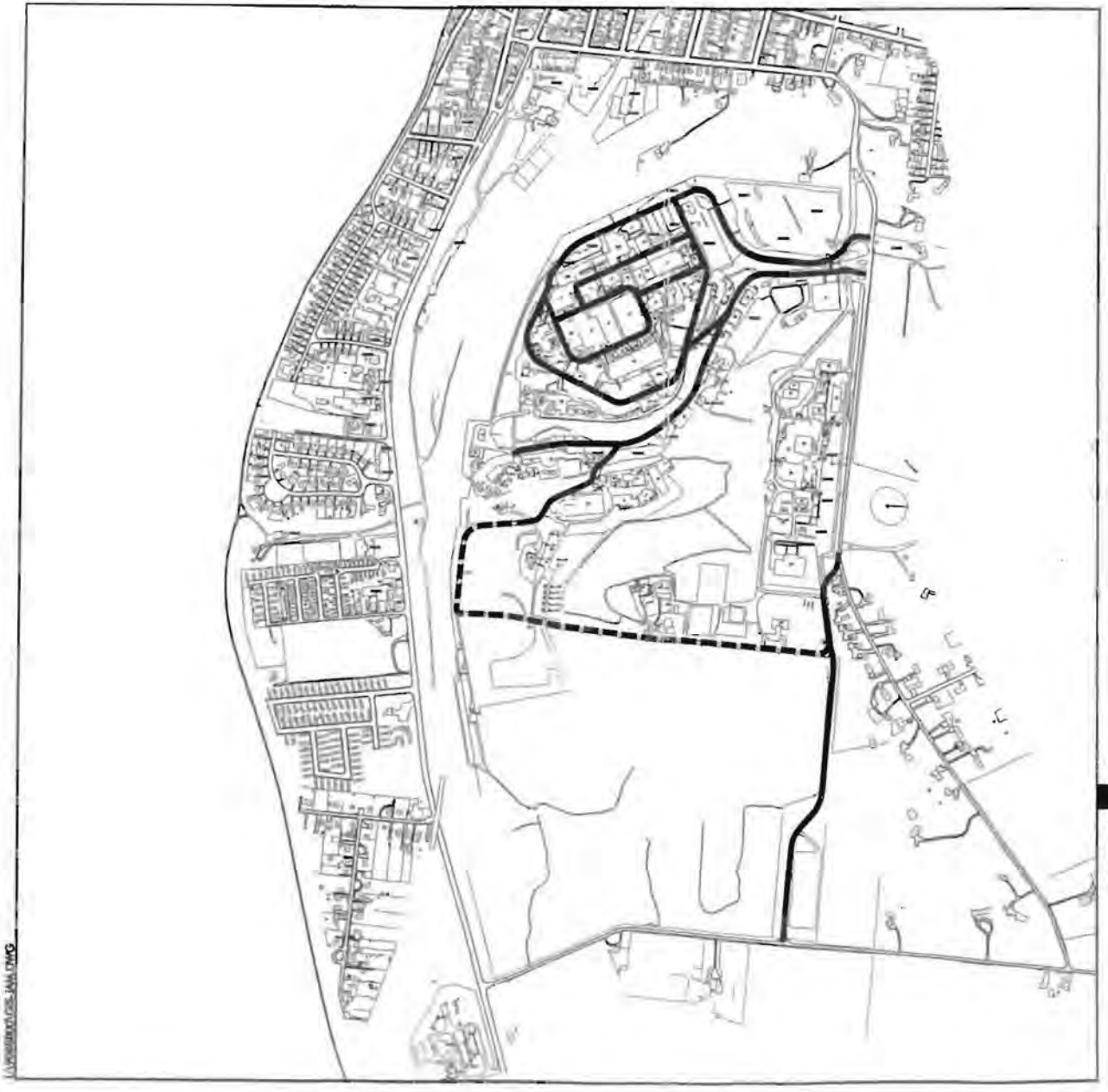

Figure 7-2

Roadway Improvements Option #2

Legend

Public Right-of-Ways

Access Roads
(Restricted to General Public)

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

August 1996

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

0 375 750 1125

N

Parking Lots

Assumptions

The following assumptions were used to develop parking requirements for the three Reuse Options:

- City of Miamisburg requirements for the number of parking spaces are based upon facility usable floor space area. The functional use of the facilities in each Reuse Option can yield different usable floor space. Accordingly, the use of gross floor areas throughout the development of options will be rather conservative and provide an added contingency factor.
- New developments in Miamisburg usually require separate parking lots for each building. For the Reuse Options, shared parking will be assumed which may necessitate a variance from the Board of Appeals.
- Miamisburg requires 1 space /2,000 square feet of usable floor space for Industrial use and 1 space/300 square feet of usable floor space for Professional Office use.
- Due to the uncertainty of the final usage in the three Reuse Options, three contingency factors will be used--20%, 60%, and 100% for Reuse Options 1, 2, and 3, respectively.

Based upon these assumptions, the estimated number of parking spaces required are provided in Table 7-3.

Table 7-3 Estimated Number of Parking Spaces Required

Reuse Option	Space Type	Bldg. Gross Sq. Ft. x 1000			Required Parking Spaces		
		Existing	Proposed	Total	Required	Contingency	Totals
1	Industrial	556	0	556	278	56	334
	Prof. Office	246	0	246	821	164	985
Total							1319
2	Industrial	447	0	447	224	134	358
	Prof. Office	235	0	235	784	470	1254
Total							1612
3	Industrial	340	660	1000	500	500	1000
	Prof. Office	235	147	382	1275	1275	2550
Total							3550

Basis of Cost Estimates

The cost of parking lots for this study is determined from a nominal 145 space lot with an average 300 gross square feet per parking space. Thus, the 145 spaces require 43,500 square feet of surface area. The unit costs for parking lots of a nominal 43,500 square feet are provided in Table 7-4.

Table 7-4 Unit Costs for Asphalt Parking Lots[a]

Description	Quantity	Unit Cost ($)	Cost ($)
1 1/2 " Asphalt Wearing Course (AC 20)	202 CY	54.00	10,908
Tack Coat (0.5 GAL/SY)	2420 GAL	0.72	1,743
1 1/2" Base Course (AC 20)	202 CY	54	10,908
6" Aggregate Base	807 CY	22	17,754
Subgrade Comp.	4840 SY	0.77	3,727
Excavation including Embankment (assume 9' depth), Storm Drainage	1210 CY	8.00	9,680
CB 2-2-B (Assume 4)	4 EA	720	2,880
MH No. 3	2 EA	1800	3,600
12" Conduit, Type B	1200 FT	40	48,000
Incidentals (Stop Blocks, Strip, etc.)	-	-	3,000
TOTAL			**112,200**
Average Area (Sq. Ft.)	43,500		
Average Cost per Sq. Ft.			$2.58

[a] **Assume no landscaping, curbs, underdrains, or access controls.**

Cost Estimates

Based on the parking areas provided in Table 7-3 and the unit costs from Table 7-4, the costs for the three Reuse Options are provided below as Table 7-5.

Table 7-5 Costs for Parking Lots

	Reuse Option 1	Reuse Option 2	Reuse Option 3
Total Spaces Required	1,319	1,612	3,500
Parking Area (Sq. Ft. x 1000)	396	484	1,050
Unit Cost ($/Sq. Ft.)	$ 2.58	$ 2.58	$ 2.58
Parking Lots Total Cost	**$1,021,680**	**$1,248,720**	**$2,709,000**
BUDGET TOTAL	**$1,025,000**	**$1,250,000**	**$2,750,000**

Lighting (Roads, Parking Lots, and Site)

Assumptions and Basis of Cost Estimates

The following assumptions were used to develop lighting requirements for roads and parking lots:

- Ohio Department of Transportation (ODOT) type street and parking lot lighting will be used--minimum requirements of 1 candle for roadways and 1/2 candle for parking lots.
- Based on recent experience in Montgomery County, the average cost of lighting for a 40-foot wide roadway is $31.40 per linear foot or $0.80 per square foot.
- For parking lots at 1/2 candle, an assumed cost of $0.40 per square foot rounded to $0.50 (for additional engineering, light stanchions, etc.) was used.
- Internal site lighting (walkways, yards, etc.) is assumed to be the same level as for parking lots. It also is assumed that the square foot area of internal lighting required will be the same as parking.
- Total lengths of roadway in feet are 16,650, 21,400, and 23,100 for Reuse Options 1, 2 and 3, respectively.
- The areas of parking lots (in 1000 sq. ft.) are 396, 484, and 1,050 for Reuse Options 1, 2 and 3, respectively.

Cost Estimates

Based on the above assumptions, roadway, parking and site lighting costs are provided in Table 7-6.

Table 7-6 Lighting Costs for Roadways, Parking Lots and Site

	Reuse Option 1	Reuse Option 2	Reuse Option 3
Roadways			
Length (Ft. x 1000)	16.6	21.4	23.1
Cost (@ $31.40/Ft.)	$523,300	$672,000	$725,000
BUDGET TOTAL	**$525,000**	**$675,000**	**$725,000**
Parking Lots			
Area (Sq. Ft. x 1000)	400	500	1,050
Cost (@ $0.50/Sq. Ft.)	$200,000	$250,000	$525,000
Internal Site			
Area (Sq. Ft. x 1000)	400	500	1,050
Cost (@ $0.50/Sq. Ft.)	$200,000	$250,000	$525,000
BUDGET TOTAL	**$400,000**	**$500,000**	**$1,050,000**

Stormwater Detention

Introduction

Stormwater runoff detention/retention will be a critical issue as site development continues. As with all development, runoff from the developed site must not exceed the runoff that existed prior to current construction. The entire site operates under an EPA National Pollution Discharge Elimination System (NPDES) Permit that is due to be updated during 1996.

There are two existing detention basins on the Mound property. One is a small holding pond near the entrance to the site. It is a concrete lined, fenced-in basin that collects stormwater runoff from the section of the site currently being used by the DoE (Building SM, etal.). Under normal conditions, no stormwater is detained in this basin as the outlet gate is kept open. The gate is designed to be closed and the basin used as an emergency holding pond in case of a hazardous material spill and/or runoff contamination.

The second is primarily a settling pond that is part of a system designed to control runoff and allow for the testing and monitoring of all collected site runoff. This lower system, located in the southwest corner of the existing developed site, receives all of the stormwater collected from the developed site including discharge from the upper holding pond. Under normal conditions, runoff is allowed to flow through sluice gates and holding tanks to be tested for contaminants and monitored for off-site flow rates. During significant storms, the runoff is diverted to the settling pond. The pond has a design capacity of approximately 3.1 million gallons and is equipped with an overflow alarm system.

Assumptions and Basis of Cost Estimates

When calculating the required stormwater detention volumes and opinions of probable construction costs for the three Reuse Options, the following assumptions were made:

- First and most critical was the decision to assume that the existing two ponds would not be considered as useful for future detention. The upper holding pond must remain as is if it is to continue to function as an emergency containment system for hazardous material spills. The drainage area already being serviced by this pond was taken out of the calculations for the rest of the site. The lower pond is, according to Mound staff, already at or under capacity for the existing site. Additionally, since it is a retention/settling basin, most of its storage capacity is already permanently in use.

- Given the size of the site, the Rational Method was used to calculate the peak rate of runoff for the design storm and the volume of storage required. Per the City of Miamisburg, a 10-year frequency storm was used for the design storm. A "C" value of 0.4 was used for the non-developed areas due to the steep slopes. To calculate the volume of storage required, the duration of the storm was assumed to be equal to the time of concentration for these preliminary calculations.
- Parts of the drainage basin areas extend outside the site. These areas are relatively small and were included in the total area calculations but not considered for calculation of a composite "C" value.
- To determine the approximate surface area that the proposed detention basins will require, a "unit" pond was calculated by using a 1' section of a pond with the following dimensions: 50' bottom width, 10' depth, and 1:1 side slopes. Based on this "unit" pond, every 0.31 cubic yard (CY) of storage will require 1 square foot (SF) of surface area.
- Based on experience, the control structure for each detention basin area will cost in the range of $45,000 to $85,000 to construct. Excavation/grading was estimated to cost $10.40/CY.

Requirements and Cost Estimates

Using the above assumptions, methodology, and costs, the detention requirements for each of the Reuse Options were calculated and are summarized in Table 7-7. Option 1 will require only one new basin, Option 2 will require two basins, and Option 3 will require three basins. To assist in planning and site layout, an approximate area requirement for each of the basins is calculated based on the "unit" pond discussed in the fourth Assumption. The table lists probable construction costs for each of the new basins and provides a total cost for each Reuse Option.

Table 7-7 Stormwater Detention Requirements and Estimated Costs

Reuse Option	New Basin	Detention Capacity Req'd (CY)	Approx. Area Req'd (SF)	Excavation/ Grading Costs	Control Structure Costs	Total Cost Per Basin	Total Reuse Option Cost
1	A	13,940	45,770	$145,000	$80,000	$225,000	**$225,000**
2	A	14,370	45,120	$149,500	$75,000	$224,500	
2	B	530	1,670	$5,500	$45,000	$50,500	**$275,000**
3	A	15,390	48,320	$160,000	$80,000	$240,000	
3	B	530	1,670	$5,500	$45,000	$50,500	
3	C	4760	14,950	$49,500	$80,000	$134,500	**$425,000**

Water Supply/Wastewater Disposal

Assumptions

In order to minimize costs, the Mound's existing potable water and wastewater treatment capabilities will be used with necessary upgrades to meet current standards. Schematic drawings of the site Potable Water and Sanitary Sewer Systems are provided in Figures 7-4 and 7-5, respectively.

Assumptions for potable water are:

- The existing SM/PP water tower can continue to be used and connected to the City of Miamisburg's water distribution system in its medium pressure district.
- It is assumed that the City's water treatment plant will be expanded commensurate with additional water requirements.
- A new water line will be added to serve the south end of the site and connected to an existing 12-inch water main (required only for Reuse Option 3).
- The Mound water wells can be used to provide water for fire protection. The pumps and storage tank for fire protection will be maintained.

The following assumptions relate to wastewater:

- Wastewater flow estimates were developed on the basis of four categories of facility reuse: Office, Laboratory, Light Industrial and Storage.
- The existing Wastewater Plant will be utilized but will be limited to applications on the north end of the site.
- The Miamisburg wastewater system is assumed to be used for expansion of the south end of the site.
- The Miamisburg wastewater pump stations can be expanded if necessary.

Requirements and Cost Estimates

Using the above assumptions and methodology requirements, associated costs for the three Reuse Options were calculated and are summarized in Tables 7-8, 7-9 and 7-10.

Table 7-8 Water and Wastewater Estimated Costs
Reuse Option 1

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
TOTAL			**$675,000**
Wastewater			
No Requirements			

Table 7-9 Water and Wastewater Estimated Costs
Reuse Option 2

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
Subtotal			**$675,000**
Wastewater **North Site Additions**			
8" Sanitary Sewer	1,800 LF	$60	$108,000
Manholes	5 Each	$2,500	$12,500
Engineering, Design, Etc.	Lump	$29,500	$29,500
Subtotal			**$150,000**
TOTAL			**$825,000**

Table 7-10 Water and Wastewater Estimated Costs
Reuse Option 3

Description	Quantity	Unit Cost	Total Cost
Water **North Site Additions**			
8" Water Line	500 LF	$75	$37,500
Meters (Existing 40 Bldg.)	40 Each	$2,500	$100,000
Back Flow Preventers	40 Each	$2,500	$100,000
Inspection	40 Each	$250	$10,000
City Water Treatment Plant Expansion	0.15 MGD	$2/Gal	$300,000
System Modification	Lump	$77,500	$77,500
Engineering, Design, Etc.	Lump	$50,000	$50,000
Subtotal			**$675,000**
Wastewater **North Site Additions**			
8" Sanitary Sewer	1,800 LF	$60	$108,000
Manholes	5 Each	$2,500	$12,500
Engineering, Design, Etc.	Lump	$29,500	$29,500
Subtotal			**$150,000**
Water **South Site Additions**			
8" Water Line	4,800 LF	$75	$360,000
Hydrants	10 Each	$2,500	$25,000
4" Service Lines	2,000 LF	$25	$50,000
Meters	14 Each	$2,500	$35,000
Back Flow Preventers	14 Each	$2,500	$35,000
Inspections	14 Each	$250	$3,500
City Water Treatment Plant Expansion	0.075 MGD	$2/Gal	$150,000
Engineering, Design, Etc.	Lump	$196,500	$196,500
Subtotal			**$855,000**
Wastewater **South Site Additions**			
6" Sanitary Sewer Laterals	2,000 LF	$40	$80,000
8" Sanitary Sewer	4,800 LF	$60	$288,000
Manholes	14 Each	$2,500	$35,000
Saxony Road Pump Station Expansion	0.05 MGD	Lump	$50,000
City Wastewater Treat Plt Expansion	0.05 MGD	$3/Gal	$150,000
Engineering, Design, Etc.	Lump	$67,000	$67,000
Subtotal			**$670,000**
TOTAL			**$2,350,000**

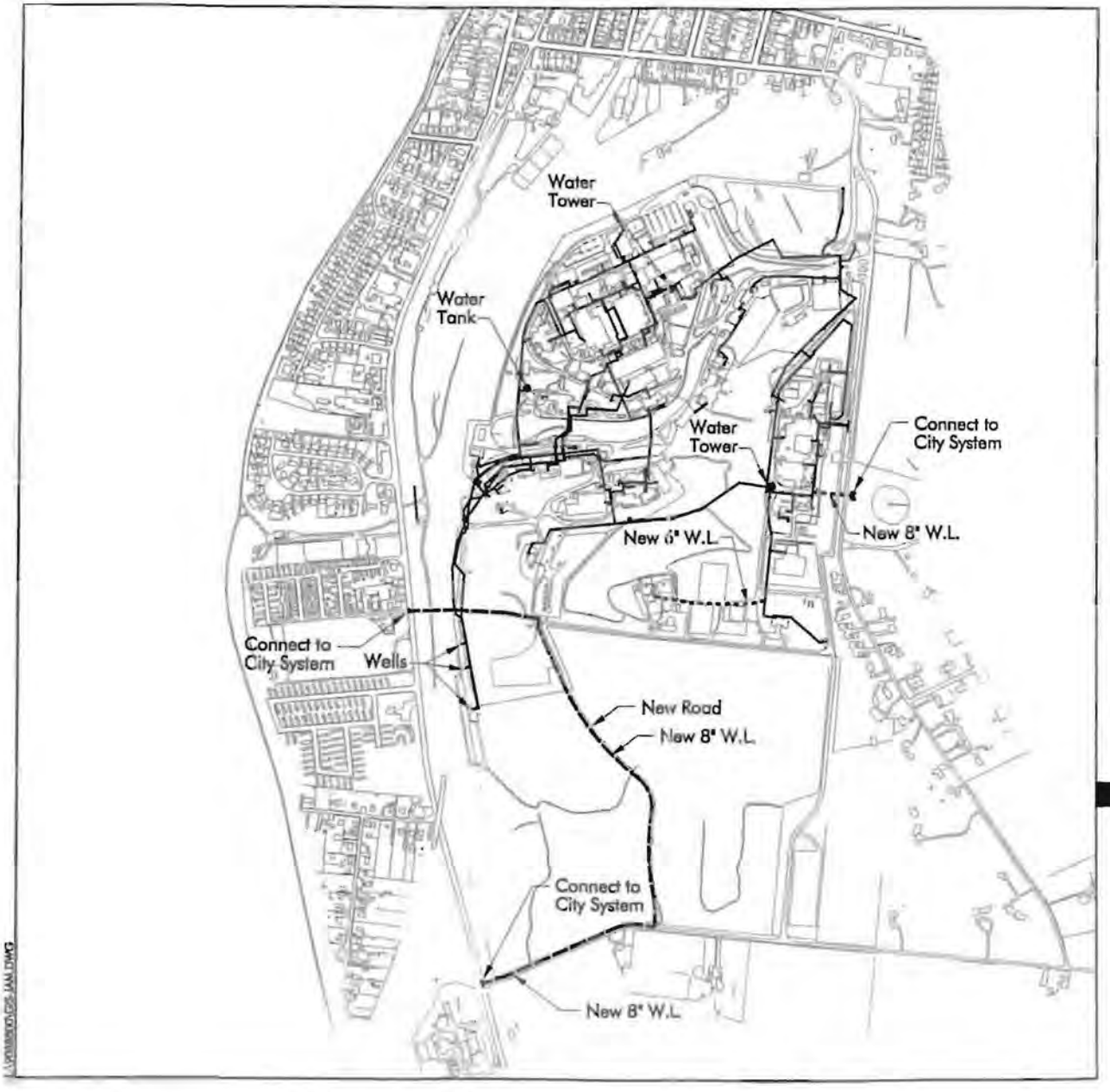

Figure 7-4

Potable Water Distribution System

Legend

————	Existing Potable Water Distribution System
- - - - - -	Options #1, #2, and #3 System Improvements
— — — —	Option #3 Additional System Improvements

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

August 1996

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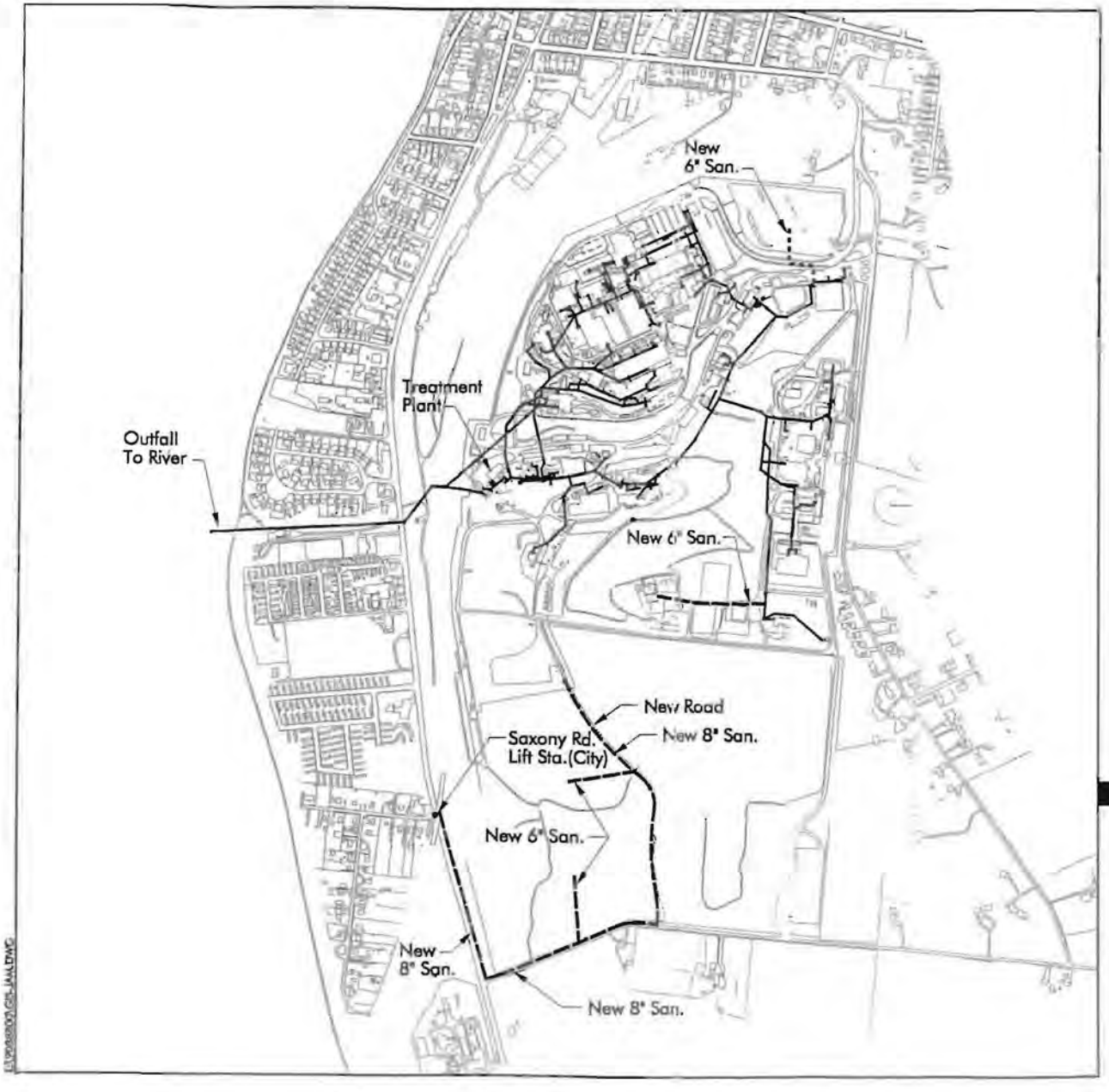

Figure 7-5

Sanitary Sewer System

Legend

Existing Sanitary Sewer System

Options #2, and #3 System Improvements

Option #3 Additional System Improvements

Miamisburg Mound Reuse Plan

Miamisburg Mound Community Improvement Corporation
Miamisburg, Ohio

August 1996

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Electric

Asumptions

It is assumed that DP&L will take possession of the site distribution system. The cost estimates provided herein are assumed to be total system upgrade, some of which may be assumed by DP&L. Upgrade/modifications for all Reuse Options include:

- Modification of existing substations/transformers
- Providing new pad mounted transformers
- Modification of existing duct bank
- Installation of DP&L provided meters and current transformers
- Modification of existing duct bank
- Installation/modification of miscellaneous wire, cable and conduit

Reuse Options 2 and 3 include the installation/upgrade of additional state-of-the-art communications network required for operation of a Technology Center.

Reuse Option 3 includes additional communications network and relocation of the overhead electric services to underground duct banks.

Basis of Cost Estimates

- Pad-mounted transformers were sized to meet the need of the specific facilities they serve. Costs were estimated using standard costs.
- Modification of the existing substations and installation of meters were estimated based on experience.
- Miscellaneous costs for conduit, duct bank, etc. are preliminary estimates without firm basis.
- Similarly, costs for modification of the existing communications network and the acquisition of state-of-the-art communication capabilities are preliminary estimates and not well validated.
- Burial of up to 10,000 linear feet of electrical and communications conduit may be required in Reuse Option 3. Normally, this cost is approximately $25.00 per linear foot. Due to the uncertainties in the geological attributes of the soil and the potential restrictions of specific geographic areas which were contaminated, the estimated cost is doubled.

Cost Estimates

The estimated costs for electric are provided in Table 7-11

Table 7-11 Cost for Electric

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Pad Mount Transform. (39)	525	525	525
Mod. Exist Substations (12) and Install 56 Meters	75	75	75
Misc. Conduit/Cable Upgrade	100	100	100
Pull Lines, Duct Bank Mod.	250	250	250
Existing Commun. Upgrade	50	50	50
State-of-the-Art Communications Network	-	500	750
Burial of Electric and Communications	-	-	500
TOTAL	1000	1500	2250

Natural Gas

Assumptions

The relocation of the natural gas distribution systems will take place if the Central Utility Plant is closed down, Decentralized HVAC Utility Plants are utilized, and the overhead utility distributions are eliminated. Details for the relocation of the distribution system are difficult to project with any degree of certainty without more extensive analysis of physical conditions, such as geological attributes and more detailed design. Accordingly, costs for natural gas are estimated per building. A conservative cost estimate of $10,000 per building is used. This includes cost for relocation of the distribution systems, metering, and installation to required boilers.

5-2.7.2 Cost Estimates

The cost for natural gas is provided in Table 7-12.

Table 7-12 Cost for Natural Gas

	Reuse Option 1	Reuse Option 2	Reuse Option 3
No. of Buildings Served	40	30	50
Total Cost (@ $10,000/ Bldg.)	$ 400,000	$ 300,000	$ 500,000

Mechanical (HVAC)

Assumptions and Cost Estimates

HVAC Utility Plants, Appendix 6, provides a detailed analysis and cost ramifications for the replacement of the Central Utility Plant with Decentralized HVAC Utility Plants. If elected to be pursued, conversion to Decentralized Units will be evaluated and costs provided on an individual building basis. This was discussed in Section 3. For completeness, the total cost is repeated here on a Reuse Option basis rather than a Building basis as provided in Appendix 6.

Table 7-13 Costs for Decentralized HVAC Plants

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Total Decentralized Plants	$7,088	$5,871	$4,678

Demolition of Stanchion Lines

Assumptions

In the event the Central Power Plant (Building P) is discontinued and individual Decentralized HVAC Plants are installed, the utility stanchions should be removed.

- It is estimated that it will require two craftsmen two days (32 hours total) to remove a stanchion.
- Assumed Cost $25.00/hour or $800.00/stanchion

Cost Estimates

The cost of removal of the stanchions is independent of the Reuse Options. Based on a nominal 50 stanchions, the cost is as follows.

Table 7-14 Cost for Stanchion Line Demolition

	Cost ($ x 1000)		
	Reuse Option 1	Reuse Option 2	Reuse Option 3
Stanchion Line Demolition	$400	$400	$400

Summary of Site Infrastructure Costs

The site related costs delineated above are summarized in Table 7-15.

Table 7-15 Summary of Site Infrastructure Costs

Details in Section	Item	Cost ($ x 1000)		
		Reuse Option 1	Reuse Option 2	Reuse Option 3
5-2.1.3	Roadways	975	1275	1400
5-2.3.2	Roadway Lighting	525	675	725
5-2.2.3	Parking Lots	1025	1250	2750
5-2.3.2	Parking Lot and Site Lighting	400	500	1050
5-2.4.3	Stormwater Detention	225	275	425
5-2.1.3	Stormwater Drainage	1750	2150	2325
5-2.5.2	Water and Wastewater	675	825	2350
5-2.6.3	Electric	1000	1500	2250
5-2.7.2	Natural Gas	400	300	500
5-2.8.1	Mechanical (HVAC)	7088	5871	4678
5-2.9.2	Stanchion Demolition	400	400	400

Miamisburg Mound Comprehensive Reuse Plan

Final Comprehensive Reuse Plan
January 1997

Prepared for:
Miamisburg Mound Community
Improvement Corporation

Prepared by:
Sasaki Associates, Inc.

in association with
URS Consultants
Economics Research Associates
Hamilton, Rabinovitz & Alschuler
Environmental Technologies & Communication

COMPREHENSIVE REUSE PLAN

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Introduction

Plan Summary

The proposed Reuse Plan for the Mound Advanced Technology Center (MATC) is designed to create a contemporary research and industrial park.

The proposed plan has five principal features: First, the redevelopment anticipates a major clearance and cleanup of existing buildings and other miscellaneous structures including the overhead steam lines and unneeded fencing. A core group of 33 buildings on the site totaling 694,600 gross square feet will be retained for reuse. The effect will be to consolidate future research and development into a more efficient core group of the existing larger, better quality buildings and permit the introduction of adjacent parking and green space consistent with the campus-like character of a modern research and industrial park.

A second principal feature of the plan is the "greening" of the Mound through a proposed reforestation program to control erosion on the steep hillsides and improve stormwater management. Coupled with the overall clearance and cleanup, the reforestation program also will improve the aesthetics, enhancing marketability of the site.

Third, the principal infrastructure improvement is a proposed new spine road which will integrate access throughout the site to existing buildings and proposed new building sites. The spine road will clarify internal vehicular circulation beginning at a redeveloped entry at Mound Avenue, passing through the Test Fire area, south to Benner Road, opening up the undeveloped southern half of the site to new development. The proposed new spine road will feature landscape entries at Mound Avenue and Benner Road and will be designed to community standards with appropriate drainage, street tree planting and lighting

Fourth, the plan provides development sites for significant new building development in the future in response to market demand. An estimated 840,000 square feet of new research and industrial development could be realized on these sites. Important new building sites are shown at the Mound Avenue gate on the site of the existing parking area, on the brow of the hill hear OSE building and on developable land on the southern half of the site. Each of these parcels will permit development of contemporary research and industrial buildings with their associated parking.

Fifth, The proposed plan groups existing buildings to remain and new development sites into a series of development districts which are coordinated with the Mound Ten Year Plan release schedule. The development parcels consist of two principal types: those organized around existing clusters of buildings and parcels which will allow new building development.

The most significant development parcel is the Main Hill, site of the historic core of Mound activity. The Main Hill is divided into two parcels. This permits segmentation of the "front" of the hill where office, research and industrial uses are located, from the "back" of the hill where cleanup activity for radioactive buildings will extend to 2005 or later. Reuse of the buildings on the Main Hill requires a significant amount of demolition and the creation of new parking within reasonable walking distances of the building. The clustering of buildings and parking on the hill creates a setting where parking must be shared. As the buildings are demolished or improved and leased, and as parking is constructed, an excellent site for a new building is created on the brow of the hill with direct connection to the spine road.

A second significant cluster of existing buildings will remain in the Test Fire parcel. These buildings are the site of ongoing explosives research and manufacturing. Many are leased and it is anticipated tat they will continue to attract explosives-related businesses. Improved parking and a new entrance from the spine road combine to provide a unique identity for this area. Some demolition is anticipated, but no new development sites are created with this parcel.

Two smaller parcels are created south of the spine road. One, containing building 61, adjacent to the Mound Avenue entrance, is identified separately because of its "front door" location potential use for a variety of businesses. No new development opportunity exists.

A second parcel contains a variety of existing buildings and will retain two existing buildings and create a site for a new building. The new building could accommodate R&D businesses. The new building site, with a spine road address and location at the intersection of the road serving the Main Hill, has potential value after market success is demonstrated through the leasing of the existing buildings at the Mound.

The final "developed" parcel at the southern end of the SM-PP area contains two existing buildings, one already leased. The parcel also offers a site for a new building, connected to or separate from building 100. An improved entrance and spine road segment provide direct access and visibility from Mound Avenue.

Three parcels of land are designated as sites open for new development. The economic strategy for development of the Mound recommends that they not be sold or developed until the MATC is established as a viable mixed-use research and technology park. This recommended phasing is to allow for increased land values and make Miamisburg Mound Community Improvement Corporation (MMCIC) a more attractive development partner. No improvements are proposed to be made to these land parcels as part of the cleanup and improvement process undertaken by U.S. Department of Energy (DOE).

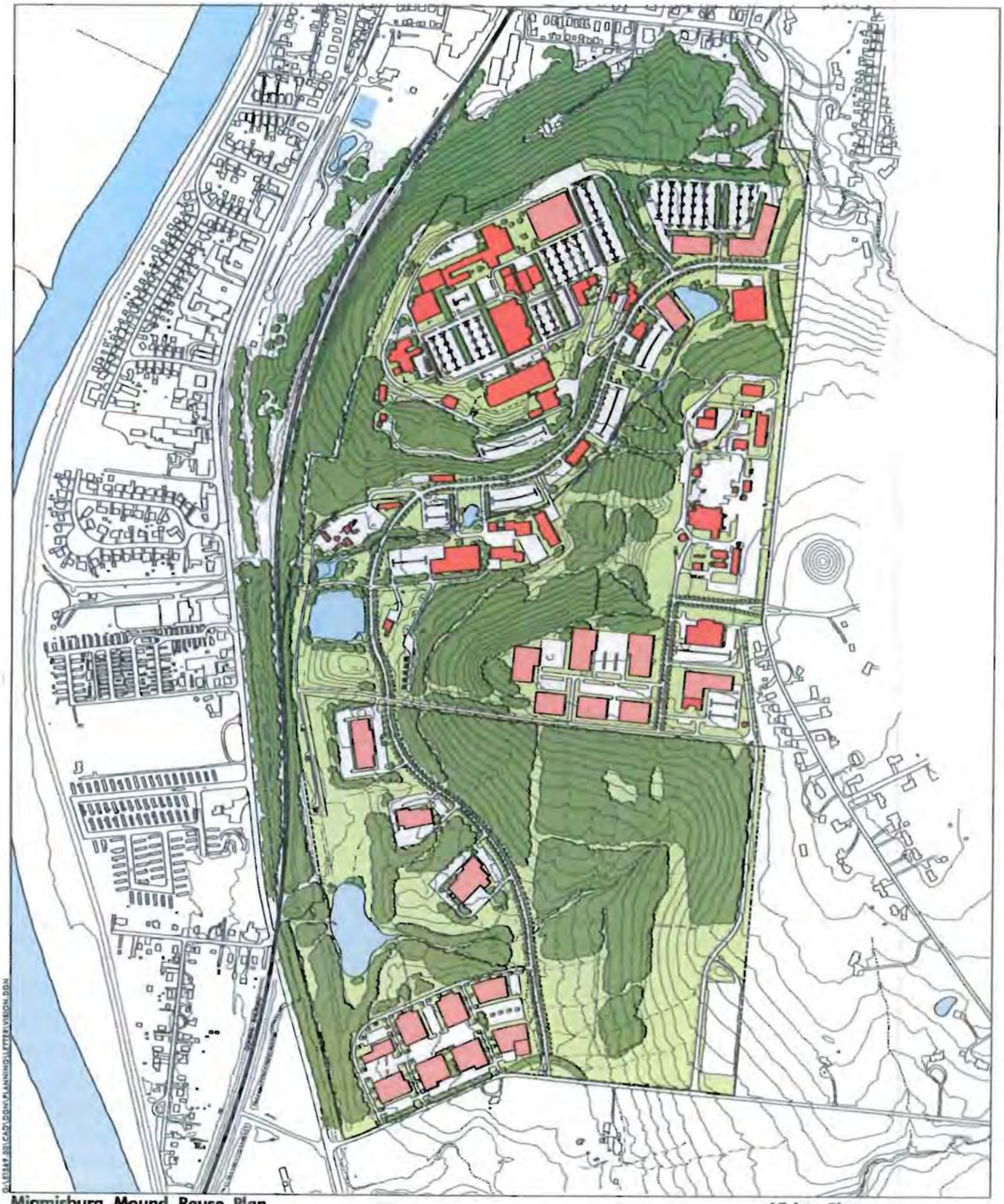
The first of the open land parcels is the lower parking lot. Development potential will be created by relocating parking to the Main Hill to serve those buildings. The access and visibility of this location create the potential for higher value research and development uses.

A second open land parcel is positioned just west of SM-PP on land that overlooks the river valley. The overlook parcel offers the potential for a variety of uses, but is designated as suitable for general industrial use. The existing buildings are assumed to be demolished as part of the cleanup.

The final land development parcel is the undeveloped area south of the main portion of the Mound. This so-called "South 40" parcel, while significantly constrained by steep slopes and the floodplain, offers at least four segments of land suitable for industrial or "flex"-type development. 290,000 Square feet of new development with its associated parking can be located in this area.

The Mound also includes two land areas that do not offer development potential. One is a parcel at the west side of the site that is the location of the sewage treatment plant. The ultimate disposition of this parcel will depend upon who assumes responsibility for management of the treatment plant.

The SM-PP area is not part of the study area for reuse of the Mound. This area is the site of ongoing DOE/NASA activity. Because of its location on and direct access from Mound Avenue, its long-term disposition will not affect the configuration of the balance of the development. This access characteristic does suggest that the area has the potential for long term utilization as a site for technology related business.



Miamisburg Mound Reuse Plan

Vision Plan

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

- Surface Water/Wetlands
- Lawn /Old Fields
- Trees
- Existing Mound Buildings
- Proposed Mound Buildings
- Paved Surfaces
- Aquifer

December 1996

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The Planning Process

A comprehensive, multidisciplinary planning and economic feasibility study process has been undertaken to develop the Reuse Plan for the Mound. A team of planners, engineers, economists and designers utilized a process similar to a real estate "workout" and "corporate restructuring" to address the challenge of planning for an economically viable reuse of the DOE facility.

The planning process incorporated four phases of work:

- Feasibility Analysis
- Development Options
- Final Comprehensive Plan
- Plan Documentation

The reuse planning process for the Mound has been an open, public process in an attempt to balance the goals and objectives of three constituent groups: the community, DOE and MMCIC.

In the feasibility analysis phase of work, the consultant team undertook a preliminary comprehensive assessment of the site, facilities, infrastructure and the real estate market. The goal of this phase was to define the property's assets and limitations and develop an "end state" concept that could be used to test the preliminary feasibility of reuse and redevelopment of the Mound.

Following the feasibility analysis phase, the consultant team completed the analysis of the facilities, infrastructure and market. Particular emphasis was placed on defining assumptions that would influence the direction of reuse options for the Mound. Through this analysis, the consultant team developed a series of options for reuse. Each of these options was evaluated in terms of its ability to meet the goals of the projects' stakeholders (the community, DOE and MMCIC).

The options that were considered included a range of strategies focusing on the market that was identified to be present in the Miamisburg area. These options explored an all-industrial strategy that sought to develop or sell the Mound to industrial users, an all-research and technology strategy that focuses more exclusively on the high tech market, and a mixed use research and industrial strategy that sought to be attractive to a range of office, research and industrial users. Of these three alternatives, the last proved to be the most viable economically and was preferred by the MMCIC and Mound Reuse Committee (MRC).

In addition to these options, the potential for complete clearance of the site and finding a single user were explored. The clearance option proved infeasible because of the loss of all jobs and the increased cost of cleanup for other, non industrial uses. The single user option was not pursued because of the very low probability of its success.

After reviewing the options, the MMCIC and MRC selected the Mixed Use Research and Industrial option that is documented here. The option has the highest probability for success, establishes a framework for ongoing MMCIC and DOE cooperation in achieving a successful transition, and provides the framework for the success of the MATC.

Goals And Objectives

The goals and objectives that have been established for the Mound reflect the joint efforts and joint interests of the community, MMCIC and DOE. The following have been prepared, reviewed and approved by each of these groups as a joint statement.

Shared Goals

Three goals are common to all of the groups involved in seeking a successful reuse of the Mound.

- An environmentally clean site.
- Successful transition of the Mound.
- Creation of a private research and industrial park.

Individual Goals

Although overlapping in many ways, each of the three groups has goals that are specific to the group.

Community

- Jobs, salaries and salary tax contribution.
- An economic and technological asset for the region.
- Positive visual and physical asset, "a good neighbor."

MMCIC

- Jobs and economic development.
- Mitigate the economic impact of closure upon employees and community.
- Financially viable plan.
- Achieve revenues sufficient to complete transition.

DOE

- Eliminate DOE's landlord responsibilities.
- Minimize cleanup costs to taxpayers.
- Complete cleanup and transition by 2005.

Reuse Plan Description

Market and Financial Plan

Socioeconomic Overview

The economic vitality of the region and neighborhood surrounding the Mound is an important consideration in estimating future demand and income potential. Area information, including socioeconomic, demographic and real estate market data, is significant in that it influences the redevelopment potential and market value of the Mound.

The Miamisburg Mound is located south of downtown Dayton, west of I-75 in the City of Miamisburg, which is in Montgomery County, Ohio. The site is roughly three miles west of the Route 725 interchange with I-75, the primary interstate access point for local traffic in the area. The I-675 Dayton by-pass is located just south of the Route 725/I-75 interchange, providing the Miamisburg area with excellent interstate access. Proximity to I-75 is particularly important; I-75 is considered one of the primary industrial corridors in the US, particularly for the auto industry and related manufacturers. The area surrounding the I-675/I-75 interchange has emerged as a concentration of suburban Dayton office and industrial space development, while the interchange of I-75 and Route 725 has emerged as a large suburban retail area anchored by the Dayton regional mall. See figure titled Transportation and Access.

Analysis of socioeconomic trends and forecasts for the Dayton Metropolitan Statistical Area (MSA) provides a necessary context for valuation of the Miamisburg Mound. Such indicators highlight previous areas of economic strength and weakness, as well as areas with future growth potential in the region. This section will highlight historic population, employment, major employers and business start-up activity in the Dayton MSA. Specific emphasis will be placed on employment trends in manufacturing sectors of the regional economy as well as demographics for Montgomery County including the City of Dayton and Miami Township which includes the City of Miamisburg for analysis purposes.

The Dayton area historically has been synonymous with manufacturing and technological innovation. Dayton area inventors were responsible for several major innovations, including the auto self-starter, the airplane and the cash register, in the early 20th Century. Such inventions had a particular impact on the Dayton area beginning in the 1920s as firms such as General Motors, Chrysler and National Cash Register (NCR) expanded their manufacturing facilities in the Dayton area. According to the Wall Street Journal, technological innovation in the Dayton area has remained strong since the 1920s, resulting in such

commonplace items as storage batteries, liquid crystal displays, photocells and Inkjet printers.[1] These factors affect the demographic character of the area.

Population

The Dayton MSA covers four counties in west-central Ohio: Montgomery, Greene, Clark and Miami. The following table highlights county population levels in the MSA since 1960. The table shows that Green County, located east of Montgomery County, has experienced the highest amount of absolute population growth between 1960 and 1995, growing by more than 46,500 persons overall.

Table 1: County Population Estimates, Dayton MSA, 1990 - 1995

County	1960	1970	1980	1990	1992	1995	Change 1960 - 1995
Montgomery	527,080	608,413	571,697	573,809	576,836	570,490	43,410
Greene	94,642	125,057	129,769	136,731	139,397	141,181	46,539
Clark	131,440	157,115	150,236	147,548	147,617	147,731	16,291
Miami	72,901	84,342	90,381	93,182	94,842	97,010	24,109
MSA Total	**826,063**	**974,927**	**942,083**	**951,270**	**958,692**	**956,412**	**130,349**

Source: Miami Valley Regional Planning Agency

Although Montgomery County grew at a substantially faster rate between 1960 and 1970 (increasing by over 80,000), the county was unable to maintain such rapid growth over the long term. By 1980, population in Montgomery County had fallen by about 36,000, negating about 45% of incremental population growth achieved in the county between 1960 and 1970. Greene County also recorded a population surge between 1960 and 1970, growing by more than 30,000. Overall, the Dayton MSA grew by roughly 150,000 between 1960 and 1970 which is equivalent to annual growth of about 1.7% over the ten-year period. Since 1970, the Dayton MSA has experienced inconsistent growth, recording increases in population between 1980 and 1990 and population decreases between 1970 and 1980 as well as 1992 to 1995.

Population decline in the Dayton area between 1970 and 1980 was particularly strong, falling by about 32,000. Although a variety of factors certainly influenced the rate of MSA population decline during that period, one source indicated that the Dayton area also experienced a period of considerable economic instability in the 1970s and early 1980s, which resulted in a loss of roughly 50,000 manufacturing jobs in the metro area.[ii] Beginning in the 1970s, the US economy

was increasingly influenced by international competition; NCR, a major employer in the Dayton area, began moving jobs abroad at this time in search of lower labor costs, resulting in a loss of over 20,000 jobs by the mid-1980s.

Localized Demographics

The primary area of interest in this study is Montgomery County which contains roughly 70% of MSA employment and 60% of MSA population. The following table highlights 1990 census data and 2015 forecasts for population, households and employment in several civil divisions of Montgomery County. The 2015 forecasts were generated by the Miami Valley Regional Planning Commission. The table shows that Miami Township had a 1990 population of about 40,700, which is forecast to grow beyond 48,000 by 2015. Employment growth in Miami Township and the City of Miamisburg is forecast to exceed 8,400 jobs, which is the largest increase among the listed civil divisions in Table 2.

Table 2: Socioeconomic Indicators and Forecasts for Civil Divisions in Montgomery County, 1990 and 2015

	Population		Households		Employment	
Civil Division	**1990**	**2015**	**1990**	**2015**	**1990**	**2015**
Miami Township	40,700	48,559	16,457	19,673	18,509	26,888
Washington Twp.	46,609	57,919	18,149	22,328	16,920	17,334
City of Moraine	5,989	6,905	2,299	2,632	13,640	13,757
City of Kettering	60,569	61,608	26,098	26,428	32,710	32,999
City of Dayton	182,044	175,917	72,670	69,912	153,593	155,541
Montgomery County	573,809	607,000	226,192	237,532	303,200	319,000

Source: Miami Valley Regional Planning Commission

The table indicates that roughly 50% of forecast employment growth in Montgomery County through 2015 should occur in Miami Township; the township already has emerged as a center of suburban office and retail development, which is concentrated around the I-75/I-675 interchange. The City of Dayton is forecast to retain a consistent share of county total employment through the forecast period, accounting for about 50% of total employment by 2015. However, Dayton also is forecast to lose population--about 6,100 residents--over the same period. Conversely, Washington Township is forecast to capture about 35% of county population growth through 2015 while adding only about 400 new jobs. Table 2 indicates that, by 2015, The Cities of Dayton and

Kettering, along with Miami Township, will contain roughly 68% of total county employment.

Employment Trends

Employment trends for the Dayton MSA provide insight into how the regional economy has changed since the 1970s. Table 3, which highlights employment trends by industry sector between 1980 and 1994, shows that the MSA experienced considerable jobs losses in the early 1980s, in excess of 21,000 positions. The table also highlights the extent of economic recovery in the region beginning in 1984 and continuing through 1990 when roughly 75,000 new jobs were created in the Dayton area. Job creation between 1990 and 1994 was considerably slower, with only about 6,800 additional jobs created.

Table 3 also shows that, since 1983, job creation in the Dayton area has occurred in several sectors including manufacturing, wholesale and retail trades, services and government. Of the 75,000 new jobs created between 1983 and 1990, almost 45% were in services and 27% were in wholesale and retail trades. Manufacturing employment recovered considerably in the 1983 to 1985 period, growing by 10,600 jobs. Since 1985, however, manufacturing job creation has fallen, with a loss of about 3,400 jobs by 1990 and an additional 5,900 by 1994. The table shows that manufacturing's share of total employment has decreased overall from a high of 31% in 1980 to 23% in 1994. Conversely, service sector employment has grown considerably, growing from about 21% of MSA employment in 1980 to 28% in 1994. Expansion of service sector employment in the Dayton economy is consistent with national trends.

Table 3: Covered Employment Trends by Industry Sector, Dayton MSA, 1980 - 1994

Industrial Sector	1980	1983	1985	1990	1994	Absolute Employment Changes 80-83	83-85	85-90	90-94
Mining	448	277	343	422	665	-171	66	79	243
Construction	14,922	10,669	13,414	15,218	15,505	-4,253	2,745	1,804	287
Manufacturing	110,907	95,604	106,254	102,854	96,896	-15,303	10,650	-3,400	-5,958
T.C.U	14,750	13,374	14,052	17,758	18,390	-1,376	678	3,706	632
Trades	82,740	80,662	89,704	101,407	105,130	-2,078	9,042	11,703	3,723
F.I.R.E	15,572	15,715	16,428	16,962	16,968	143	713	534	6
Services	72,285	76,942	87,120	110,058	115,458	4,657	10,178	22,938	5,400
Government	44,685	41,795	41,221	44,759	46,714	-2,890	-574	3,538	1,955
Other	1,870	1,993	2,488	3,698	4,213	123	495	1,210	515
Total	**358,179**	**337,031**	**371,024**	**413,136**	**419,939**	**-21,148**	**33,993**	**42,112**	**6,803**
Manufacturing %	30.96%	28.37%	28.64%	24.90%	23.07%				
Services %	20.18%	22.83%	23.48%	26.64%	27.49%				
Government %	12.48%	12.40%	11.11%	10.83%	11.12%				

Note: Table includes covered employment, following Ohio unemployment compensation law.
Source: Ohio Bureau of Employment Services, Labor Market Information Division

Government employment, concentrated primarily at Wright-Patterson Air Force Base, has had an overall stabilizing influence on the local economy, occupying a relatively consistent share of about 11% of MSA employment between 1980 and 1994. Although government employment activity generally is insulated from market forces, changes in government policy can have a considerable effect on employment levels. Policy decisions by DOE and the military to close or reduce staff at the Defense Electronics Supply Center and the Miamisburg Mound in 1993 resulted in a loss of roughly 3,400 civilian and military jobs in the Dayton area.

Although manufacturing employment creation has not kept pace with service sector employment growth in the Dayton area, it would be incorrect to assume that the local manufacturing base is in decline. Table 4 highlights employment trends for specific manufacturing employment sectors between 1992 and 1995. The table shows that total durable goods manufacturing occupies roughly 75% of total manufacturing employment in the Dayton MSA. The two largest durable goods sectors are industrial machinery and equipment (SIC 35) and motor vehicles and equipment (SIC 371); a total of roughly 6,100 new jobs were created in the two categories between 1993 and 1995, amounting to about 75% of total new manufacturing jobs created in the Dayton area over the same period. Although the manufacturing sector lost about 1,800 jobs between 1992 and 1993, a gradual

economic recovery had created almost 8,000 new jobs in the metro area between 1993 and 1995.

Table 4: Manufacturing Employment Trends, Dayton MSA, 1992 - 1995

Manufacturing Sectors	1992	1993	1994	1995	Absolute Change 1992-1993	Absolute Change 1993-1995
Fabricated Metal Products	7,800	7,600	8,300	8,200	-200	600
Machinery & Equipment.	29,300	28,500	29,400	30,800	-800	2,300
Electronic Equipment	3,200	3,300	3,300	3,400	100	100
Transportation Equipment	3,100	2,900	2,700	2,800	-200	-100
Motor Vehicles	17,700	17,100	17,200	20,900	-600	3,800
Total Jobs: Durable	**69,500**	**67,800**	**69,900**	**75,600**	**-1,700**	**7,800**
Food & Kindred Products	2,500	2,300	2,500	2,200	-200	-100
Paper & Allied Products	5,300	5,200	5,200	4,800	-100	-400
Printing & Publishing	8,000	8,500	8,400	8,600	500	100
Rubber & Plastic	7,300	6,900	7,500	7,100	-400	200
Total Jobs: Non-Durable	**26,100**	**26,000**	**26,800**	**26,200**	**-100**	**200**
Total Manufacturing Jobs	**95,600**	**93,800**	**96,700**	**101,800**	**-1,800**	**8,000**

Source: Dayton Area Chamber of Commerce and Ohio Bureau of Employment Services

In analyzing changes in manufacturing employment, it should be noted that improvements in manufacturing productivity have been considerable in recent history; between 1982 and 1992, manufacturing output in Ohio increased by about 50% while employment remained roughly constant.[iii] The impact of increased productivity is demonstrated by a Dayton area services company, Reynolds & Reynolds, who achieved a $200 million increase in annual sales without a commensurate increase in employment during 1995.[iv] Several sources indicated that manufacturing productivity improvement will continue in the future, limiting the potential for future expansion of manufacturing employment in the region.

The amount of productivity improvement achieved by local firms, such as Reynolds & Reynolds, has enabled them to become more competitive, particularly in international markets. A recent survey conducted by the Center for Urban and Public Affairs at Wright State University indicated that roughly 40% of surveyed manufacturing firms in the Dayton area export to other countries. The extent to which local firms export is important because it helps to insulate the local economy from regional and national economic downturns.

Major Employers

In discussing the current employment situation in the Dayton metro area, it is important to note the extent to which employment is concentrated in a small number firms. The following table highlights a sample of major employers in the Dayton MSA. The table shows that two employers, Wright-Patterson Air Force Base and General Motors (GM), employ a total of over 40,000 people in the Dayton area. GM currently maintains 10 factories in the Dayton area, producing sport utility vehicles, chassis systems, air conditioning components, powertrains, air bags and other components. Wright-Patterson Air Force Base houses the Air Force Materials Command, the Wright Laboratory and the Aeronautical Systems Center.

Table 5: Sample of Major Employers in the Dayton Metro Area

Employer	Product or Service	Employment
Wright Patterson Air Force Base	Military Installation	23,000
General Motors	Auto Manufacturing	20,000
Airborne Express	Freight Forwarding	6,000
NAVISTAR	Truck Bodies	5,500
Montgomery County	Government	4,750
AK Steel Corporation	Steel Mill	4,200
Kettering Medical Center	Hospitals	3,500
City of Dayton	Local Government	3,000
University of Dayton	University	2,500
LEXIS-NEXUS	Information Services	2,200
Emery Worldwide Airfreight	Freight Transport	2,000
Dayton Thermal Products	Auto Parts	1,600
Allied Signal Spark Plug Group	Auto Parts	1,050

Source: Dayton Area Chamber of Commerce, 1995 survey.

A third employer, LEXIS-NEXUS, is an electronic information services firm located in Miami Township. The company, which provides database and information services on the Internet, was spun-off from its parent company, Mead Corporation and sold to Reed-Elsevier in 1993. The company, which has experienced considerable growth since 1993, is located in a large campus development along I-75 south of Dayton. Emery Worldwide operates a large distribution facility at the Dayton International Airport. Smaller manufacturing firms include Spectra-Physics (Laser systems) and Matsushita Electronics Corp. (CRT displays). The Dayton area is also home to a substantial number of

companies which are involved in 'high technology' industrial sectors. One such company is Motoman, Inc., a West Carrollton-based robotics manufacturer, which now controls about 30% of the US market for robotics devices. The company provides robots for use in welding and materials handling applications.

A 1996 survey of high technology in the Dayton area, conducted by the Center for Urban and Public Affairs at Wright State University, identified a substantial variety of high tech areas in which Dayton area companies are active including software development, computer services, instrument manufacturing, consulting services and biotechnology. In addition, the Dayton area is home to a large number of defense contractors working at Wright-Patterson or other installations. Roughly 50% of the surveyed high-tech respondents identified themselves as defense contractors. High-tech firms tend to be a primary focus of local economic development efforts, due to the typically higher value added created by such firms, in terms of higher salaries as well as personal and real property tax revenues.

Regional New Business Creation

While employment levels maintained by large firms, including General Motors, are frequently tied or associated to the overall health of the local economy, a superior indicator of overall economic health is the rate of new business startup activity in the region. The following table identifies the number of net new businesses created in the four-county MSA region between 1989 and 1994. The table highlights the impact of the national recession on the Dayton area in 1992 when more businesses failed then were created. However, the regional economy recovered rapidly by 1993 with the creation of 322 net new businesses. The rate of new business formation grew further in 1994 when 453 net new businesses were started.

Table 6: Business Start-Up and Termination Activity, Dayton MSA

County	1989	1990	1991	1992	1993	1994
Montgomery	72	149	80	-22	137	264
Clark	34	18	-24	-34	82	14
Greene	10	1	-32	34	81	126
Miami	-9	12	36	-6	22	49
Total	**107**	**180**	**60**	**-28**	**322**	**453**

Source: Ohio Department of Development

From a county perspective, the table shows that Montgomery County has accommodated the majority of net business start-up activity, averaging 113 new businesses on a yearly basis since 1989. In 1994, the extent of net business creation in Montgomery County was particularly strong with 274 net business formations occurring. Greene County emerged as a second area of new business activity after the recession with 126 net business formations in 1994. Discussions with local officials indicated that increased use of property tax abatements to attract new firms is one reason for the recent surge in new business formation activity in the MSA.

Conclusions

In reviewing the range of socioeconomic and demographic indices noted above, it should be emphasized that the Dayton area is expected to grow modestly in terms of total population or employment over the next five to ten years. Within the Dayton area, however, current forecasts indicate that the Miamisburg area is expected to capture a considerable share of expected regional employment and population growth. Although the Miamisburg Mound site is handicapped by limited interstate access, the property is located in a high growth area, enhancing its attractiveness for development. Also, the Dayton area still has a long history of technological innovation which has enhanced manufacturing productivity in particular and improved the international competitiveness of local firms. Employment tied to Wright-Patterson Air Force base also has helped to diversify the local economic base beyond outright dependence on manufacturing sectors.

Real Estate Market Overview

Analysis of real estate trends in the Dayton area is a key component of the valuation of the Miamisburg Mound. Documentation of local real estate activity, including inventory growth, absorption, vacancy and lease rates, for local office, industrial and R&D markets, establishes a context for determination of the marketability for the Mound site. In establishing a context for marketability, the analysis will incorporate discussion about the age and condition of existing improvements on the Mound and evaluate development issues relevant to the site's commercialization potential. Conclusions generated from the market analysis will be used to support valuation estimates for the Mound.

Statistics pertaining to development trends in local office and industrial markets were obtained from two sources, the GEM Real Estate Group and the Society of Industrial and Office Realtors (SIOR). The real estate reports published by both sources provide a general picture of development activity in the Dayton area. ERA chose to make only general comparisons between the two data sources due to possible inconsistencies relating both to property classification and submarket areas covered in each report. Real estate market data generated by GEM Real Estate was used as the primary source for this section. Background information covering local real estate activity was obtained from area brokers, the *Midwest Real Estate News* and the *Dayton Business Record*.

Real estate surveys conducted by the GEM Group cover metropolitan office and industrial markets in 1994 and 1995 for five Dayton-area submarkets. The GEM office space survey includes multi-tenant and medical/professional buildings; the majority of single tenant and government office buildings are not covered in the survey. The industrial survey includes investment grade industrial and warehouse properties which generally are larger than 20,000 square feet only. Our discussion of real estate trends in the Dayton area will examine office, industrial and R&D real estate development at the metro area level before focusing specifically on development activity in the southern submarket of Dayton which includes Miamisburg, Moraine, Kettering and Centerville.

Market Overview

Commercial real estate development in the Dayton area historically has been tied to manufacturing and industry. Local firms, including General Motors and Chrysler, have large manufacturing facilities in the area with related smaller firms providing sub-components and spare parts. As a result, when manufacturing sectors in the area expand and add additional shifts, as they are now, the Dayton area industrial market tends to improve. Conversely, local office markets have been negatively affected by a spate of corporate restructuring which has reduced

overall demand for office space and placed downward pressure on lease rates. Although leasing activity has been aided by defense contractors who provide services at Wright-Patterson Air Force Base, growth of such services is inconsistent due to the nature of federal appropriations. As a result, the Dayton area office market remains largely stagnant with small pockets of suburban growth, according to local real estate brokers. Local office markets also are suffering from over-building which occurred in the late 1980s. Discussion of industrial space, research and development space, incubator space and office space markets will be provided.

Industrial Development Trends

The Dayton industrial market is concentrated primarily along I-75, north and south of downtown Dayton. The industrial submarket is dominated by large General Motors manufacturing facilities in Kettering and Moraine, two cities east and north of Miamisburg in the southern submarket of Dayton. The northern submarket has been growing in recent history, expanding northward beyond the I-75/I-70 interchange toward the cities of Troy and Vandalia. Overall, the Dayton area industrial market contains about 46 million square feet of owner/user and speculative industrial space with the majority of space (about 75%) concentrated in suburban submarkets. The local market has recovered considerably from over-building in the 1980s although the extent of improvement has tended to lag behind other Ohio cities such as Cincinnati. By and large, the welfare of the Dayton industrial market is tied to the auto industry (General Motors); Cincinnati, about 40 miles further south on I-75, has a more diversified economy which provides greater insulation from the influence of individual companies.

According to SIOR, the majority of growth in Dayton industrial markets has occurred in suburban areas; vacancy rates for suburban industrial space fell from 12.9% in 1992 to 8.8% in 1994. Although vacancy rates for industrial space in Dayton proper also declined over the same period, the amount of vacant space remaining was still considerable, roughly 15.4% by 1994. Suburban industrial space absorption in 1993 and 1994 was consistent, averaging roughly 900,000 square feet per-year with the majority of new leasing activity occurring in warehouse and manufacturing; absorption of R&D space was minimal in 1994. Suburban markets have remained strong through the second quarter of 1995 with vacancy rates falling to roughly 6% and net absorption of about 400,000 square feet, according to the 1995 GEM market survey.

Lease rates for different industrial property types in the Dayton market vary considerably based on location, building age and design and percentage of office build-out. Recently built, investment-grade, light manufacturing, warehouse and/or distribution buildings with proximate interstate access and 5% to 10%

office buildouts are leasing for between $4.00 and $4.50 per square foot (net). Older industrial product, typically with restricted interstate access, leases for between $2.65 to $3.75 per square foot (net). Higher quality R&D/flex space, usually incorporating a larger office space build-out, typically leases for between $7.00 and $9.00 per square foot (net) with premium space achieving higher lease rates.

Operating expenses for industrial property, which can vary considerably depending on building use, typically range between $2 and $4 per square foot with utilities accounting for between $1.00 to $1.75 per square foot. Local brokers indicated that tenant improvement allowances typically are not given for newer industrial space. In situations where such allowances are given, primarily for older space, allowances of $2 and $15 per square foot for warehouse and office space, respectively, are typical. For older industrial space, tenant allowances could be used to defray costs associated with building code upgrades. Otherwise, the majority of industrial tenant improvements typically are paid by tenants, amortized over the term of the lease.

Although indicators for suburban industrial markets are positive overall, there is a considerable amount of existing warehouse and light manufacturing space which will go on the market in the near future. About 245,000 square feet of existing warehouse/light industrial space at the Moraine Business Center is under renovation with new interior treatments and facades; the space is being marketed at $2.75 per square foot. Of particular interest is the former Defense Electronics Supply Center (DESC) in Kettering which recently was closed by the Base Realignment and Closure Commission. The base, which covers about 165 acres, is improved with roughly two million square feet of 1940s vintage warehouse and office space. The City of Kettering is expected to receive title to the DESC facility in January of 1997 and will offer for lease the space that is currently vacant.

Discussions with City of Kettering officials indicated that about 500,000 square feet of space at DESC will be demolished; the official indicated that the warehouse space, about one million square feet, is structurally in "good shape," and would be expected to lease-up after necessary infrastructure improvements are made, primarily to existing HVAC and utility systems. However, the layout of industrial space at DESC, in long, narrow buildings, would tend to limit their use to larger manufacturing or distribution oriented users who need more than 100,000 square feet of contiguous space. The DESC reuse plan also identifies about 400,000 square feet for office development in two buildings. The reuse plan indicated that the office buildings each have about 196,500 square feet of contiguous floor area; however, both structures do not have windows and, realistically, are suitable only for larger, single-tenant occupancy.[9]

The DESC reuse plan identified office lease rates of $8/square foot (gross) or $3.50/square foot triple-net (NNN). Recommended industrial space lease rates would fall between $2.75 and $5.00 per square foot (gross), with smaller tenants paying a premium for leasing space. City of Kettering officials indicated that they would offer prospective tenants improvement allowances on a case by case basis, particularly if the tenant improvements add value to the property for future tenants. Recent news articles have indicated that a regional bank has indicated its intent to locate a credit card processing facility at DESC.

Industrial Market Indices

ERA undertook an analysis of the 1995 GEM Real Estate Group survey to compare vacancy rates for competitive industrial space based on the year of construction. As industrial space at the Miamisburg Mound facility was built over a long time period, 1948-1987, such analysis will highlight both competitive supply as well as vacancy rates for older industrial product in the market based on building age. Table 7 highlights the resulting analysis for the Dayton metro industrial market.

Table 7 shows that the largest increment of space, roughly 2.7 million square feet, was delivered between 1975 and 1979. Space built in this period is also highly competitive with only 3% vacant in 1995. Discussions with public affairs officials at General Motors, Inc. indicated that the company began to expand its facilities in the 1975 to 1979 period, spinning off their Fridgidare subsidiary to concentrate on auto manufacturing. Roughly 27% of the current supply of competitive space in the Dayton area was built in the 1975 to 1979 period. The second largest increment of new space was delivered in the 1985 to 1989 period when 1.85 million square feet was built.

Table 7: Dayton Area Speculative Industrial Space Inventory and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
before 1950	780,747	22,000	3%
1950 - 1959	1,103,395	95,000	9%
1960 - 1969	297,102	49,635	17%
1970 - 1974	727,759	82,608	11%
1975 - 1979	2,734,870	94,793	3%
1980 - 1981	723,557	105,000	15%
1982 - 1984	0	0	0%
1985 - 1989	1,859,482	103,901	6%
1990 - 1993	663,617	18,600	3%
1994	56,000	0	0%
1995	596,800	180,000	45%
1996	245,120	245,120	100%
Overall	**9,788,449**	**996,657**	**10%**

Note: Data is based on 1995 GEM real estate survey
Source: GEM Real Estate Group and Economics Research Associates

The 1985 to 1989 period in Table 7 corresponds to a time of considerable economic growth and real estate speculation in the region, following trends at the national level. 1995 Vacancy rates for space built in the late 1980s are tight, running at about 3%, indicating a strong demand for newer, quality space. The table indicates a total competitive industrial space inventory of roughly 9.8 million square feet with an overall vacancy rate of 10%.

Southern Submarket Industrial Development

An identical analysis of industrial space vacancy by year-built was conducted for the southern submarket of Dayton in order to determine the age and supply of industrial space which might compete with the Miamisburg Mound. Table 8 shows that the southern industrial submarket contained roughly 4.8 million square feet of competitive industrial space with an overall market vacancy of 13%. If vacant space delivered in 1995 and 1996 is excluded, current market vacancy would fall to about 4%. The table shows that almost 60% of the current industrial

space inventory in the market area was delivered in two periods, 1975-1980 and 1986-1989. Current vacancy for the combined inventory of both periods is less than 5%. Table 8 excludes industrial space at the Miamisburg Mound and at the DESC facility in Kettering, which are two federal facilities in the Dayton area that are scheduled for reduction-in-force or outright closure. Combined, the two facilities contain roughly 3.3 million square feet of industrial, warehouse and office space.

Table 8: Industrial Space Growth and Vacancy Trends, Southern Submarket, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
1950 - 1959	277,495	0	0%
1960 - 1969	130,500	2,900	2%
1970 - 1974	557,959	69,408	12%
1975 - 1980	1,355,015	15,371	1%
1981 - 1985	0	0	0%
1986 - 1989	1,203,057	97,907	8%
1990 - 1994	158,400	0	0%
1995	409,600	151,600	37%
1996	245,120	245,120	100%
Overall	**4,337,146**	**582,306**	**13%**

Note: Data is based on a 1995 GEM Real Estate survey
Source: GEM Real Estate Group and Economics Research Associates

Current redevelopment plans for both the Miamisburg Mound and DESC include demolition of functionally obsolete space, ±500,000 square feet at each location; as such, the amount of marketable office and industrial space at each location is not yet clear. While the DESC facility will be closed and transferred to the City of Kettering in its entirety by January of 1997, the City of Miamisburg will have to deal with ongoing DOE missions, administrative operations and environmental clean-up at the Mound potentially through the year 2005, tying up a portion of office and industrial space. Due to the age and functional obsolescence of some improvements at the Mound, the supply of potentially marketable space is limited. Breakdowns of projected industrial, office and R&D space availability at the Mound, as well as projected lease rates for each space category, will be provided in a later section of this report.

Overall, industrial development activity in the southern area of Dayton has become concentrated in three primary areas: Moraine, Miamisburg and Springboro. The Moraine area is one of Dayton's primary industrial centers, containing extensive manufacturing facilities for General Motors, as well as larger distribution facilities. The Moraine area is mature, containing a largely older supply of industrial property, built mostly before 1980, with minimal vacant, unencumbered land suitable for industrial development.

Available land further south along I-75 and I-675 in Miamisburg and Springboro became more attractive for development particularly in the 1980s. A large industrial development emerged at the Springboro exit on I-75 (W. Central Avenue) between 1986 and 1991, when over 500,000 square feet of distribution, warehouse and flex/office space was built. The rate of development which occurred in the Springboro area in the 1980s was considerable; during a fieldwork assessment of the area, only two vacant industrial parcels were noted, covering a total of less than nine acres. According to a local broker, the two parcels were listing for roughly $75,000 per acre. The area now has several high-profile tenants, including Pioneer (audio systems distribution) and Alcoa (metals processing). The Danis Company, a local developer, controls roughly 206 acres of land on the border of Montgomery and Warren Counties, south of Miamisburg; Although the company is trying to have the property annexed to Springboro, Montgomery County officials are trying to forestall the annexation, according to the Dayton Business News.[vi]

A third concentration of south suburban industrial development has emerged in two sub-areas of Miamisburg, one being the I-75/I-675 area and the other being the Miamisburg northern industrial district. Industrial space in the interstate corridor area was generally built in the mid to late 1980s; the space is typically investment grade, multi-tenant space with office and industrial functions. According to local brokers, vacant land with industrial zoning and interstate frontage is currently listing for between $50,000 and $60,000 per acre. The supply of vacant land in competition with the Mound is located primarily at the intersection of Benner and Byers Roads in Miamisburg, west of I-75; the site contains roughly 165 acres and is zoned for industrial development. One 11-acre parcel, located east of I-75 along Lyons Road, is currently listed at almost $90,000 per acre.

An area of industrial activity in Miamisburg also emerged north of downtown along the Great Miami River. The area was zoned for light industrial activity and designated as a community reinvestment district, allowing companies which locate in the district to receive tax abatements and other incentives. Discussions with local brokers and city officials indicated that the district is nearly built-out, with one or two small parcels remaining. The district, which is predominated by older

single-tenant and owner/user industrial buildings, is roughly comparable to the Miamisburg Mound in terms of rail and interstate accessibility.

Mound Industrial Space Absorption Implications

The southern submarket of Dayton achieved annual absorption of roughly 300,000 square feet of owner-user and speculative space in 1993 and 1994, which was about 30% of total industrial space absorption in the Dayton area. The absorption indicators for 1993 and 1994 show considerable improvement over 1991 and 1992 when the Dayton area experienced overall net negative absorption due, in part, to the national recession. Although ERA was unable to acquire absorption data for Dayton area office and industrial markets prior to 1990, the 1993 and 1994 absorption indicators provide a reasonable perspective on current demand in the marketplace, which is defined largely by restrictive lending requirements and conservative company expansion plans. Financing for new development is still tied primarily to pre-leasing requirements as well as the credit-worthiness of tenants and developers. Discussions with local brokers would indicate that such circumstances will continue to define the nature of development activity in the Dayton industrial market through the near future.

According to local brokers, the majority of absorption has occurred in investment-grade industrial buildings which typically are multi-tenant or build-to-suit properties, recently built, with 19 to 20 feet of clear warehouse ceiling height, dock-high truck access and a minimal office build-out. Industrial space at the Miamisburg Mound, by comparison, is generally older, suffers from obsolescence, with varied office space build-outs and cannot be considered investment grade. In addition, manufacturing and lab spaces at the Mound tend to be over-engineered, i.e., built to unnecessarily high specifications. Most private sector applications do not require the excessive tolerances, reliability levels and redundancies built into space and equipment for DOE applications at the Mound, which translates into higher operating costs for private-sector tenants without a comparable increase in value added. Also, a proportion of research and manufacturing facilities at the Mound are suitable for only specific niche industrial activities such as explosives testing.

Despite such problems, the Miamisburg Mound facility is located relatively proximate to two interstate routes (I-75 and I-675), as well as existing concentrations of office and industrial development. Proximity to existing industrial and R&D activity is important in that it creates both economies of scale and location which tend to attract additional firms to the area in order to benefit from a skilled labor force, for example. In addition, the Mound facilities also contain a substantial amount of unique, state-of-the-art testing and analysis equipment which is now available for use. The existence of such equipment, some of which is highly specialized, is significant in that it may increase the geographic area from which the facility can attract tenants, providing the facility with a discernible competitive advantage.

For this reason, the use of conventional market capture rates, based solely on industrial absorption activity in the Dayton area, may understate potential demand for facilities at the Mound. In particular, likely demand for the range of advanced testing and analysis equipment at the facility will have a considerable influence over its redevelopment potential; a separate analysis of market potential for various high-technology applications of Mound equipment will be presented in an upcoming section.

It is ERA's contention that demand for Mound space in the future will be driven primarily by the marketability of testing and research equipment as well as the skilled labor force at the Mound. The combination of factors will generate considerable locational economies for future Mound users, increasing the attractiveness of the site for other high-tech businesses that then can tap into a highly-skilled employment base. Because of the moderate quality of the space, to remain competitive, the MMCIC will need to offer below-market lease rates for all space categories and incorporate subsidies for operating costs or rent to attract and maintain smaller start-up tenants which typically operate with thin profit/loss margins. More importantly, the demand forecast assumes that DOE is able to remove all radiological contamination from the site. ERA is assuming that that the Mound site could capture about 50,000 square feet of industrial development per-year; the actual amount of absorption could be higher, given the reasons outlined above. Discussion of commercial applications for Mound equipment will occur in the next section.

Industrial Land Absorption Indicators

Redevelopment of the Mound facility also includes development of several parcels, currently vacant or otherwise, covering a total of roughly 155 acres. About 120 acres of vacant land were purchased by DOE in the 1980s for expansion which never occurred. Current planning studies indicate that about 40% of this acreage is suitable for development due to poor soils, exposed bedrock

and possible radiation contamination. The vacant acreage is also adjacent to the 100-year flood plain for the Great Miami River. In addition to the 124-acre parcel, other acreage will become available as buildings are demolished, making way for improved parking arrangements and infill building sites. Current MMCIC plans indicate that the vacant acreage will either be sold in bulk to a single developer or sold as separate parcels. ERA has recommended that consideration be given to build-to-suit or land lease arrangements as alternatives, which would enable MMCIC to maintain ownership and exert greater control over development activity on the Mound.

Assuming that road access to the Mound is improved, that the land is priced at or below market rates and that environmental cleanup efforts occur on schedule, absorption of land for business park development could begin by 1997 or 1998. Competitive pricing of vacant property will allow the Mound to capture an increased share of absorption which would otherwise be captured by sites closer to I-75, including the 165-acre site at Benner and Byers Roads in Miami Township, as well as other industrial acreage in Springboro. Local real estate specialists indicated that the City of Springboro has an aggressive policy of offering incentives, including tax abatements, for new industrial development; the City of Miamisburg would need to offer comparable incentives to be competitive. The Mound could capture a minimum of 20% of submarket land absorption (roughly 2.5 acres per year) for industrial development based on accessibility and relative proximity to the I-75/I-675 interchange as well as the overall lack of competitive vacant land in the area by 1997.

The logic behind use of the 1985 to 1995 period for quantification of land absorption is based on the fact that local industrial markets were considerably over-built in the late 1980s, leading into a period of considerable instability in local industrial markets between 1990 and 1993 when new construction activity slowed dramatically. Use of the ten-year boom to bust to recovery cycle should be representative of overall demand for industrial land in the southern submarket.

Research and Development Space Trends

The Dayton metropolitan area has several concentrations of research and development activity. One primary center is the Miami Valley Research Park, a not-for-profit development on 1,250 acres of land in Kettering, just south of Wright-Patterson Air Force Base. The park was sponsored and planned by four area universities; the first research building was built in 1985. Development of the park was subsidized by a $20 million grant and donation of 675 acres by the State of Ohio. Currently, about 150 acres of the park have been developed with about 715,000 square feet of office, flex and R&D space; vacancy is less than 4%. The park is planned for a 40 to 50 year build-out.

The park is geared specifically toward "scientific oriented manufacturing" targeting larger firms interested primarily in the R&D stages of manufacturing including prototype development and testing. The foundation has built speculative space for smaller tenants and also sells land to owner/users, such as Kodak, for larger facilities. The executive director indicated that three new owner/user buildings are planned for construction by the end of 1996, totaling roughly 230,000 square feet. Quoted lease rates for speculative space in the park run $15 to $17 per square foot, full service. Operating expenses at the park typically run between $4.00 and $4.50 per square foot.

Of the 35 tenants currently renting space at the park, about 23 are defense contractors who work at Wright Patterson Air Force Base. The amount of space used by defense contractors at the research park is significant in that it may confuse interpretation of Dayton area R&D absorption indices. Since contracts for government work are not infinite and subject to political influence as well, the amount of government business captured by the research park does not provide a reliable indication of true market demand for R&D space in the Dayton area.

A second area of high-tech development has emerged around Wright State University, along Colonel Glenn highway in Fairborn. Several business parks, including the Wright Executive Center, recently have been developed in this area which is adjacent to Wright-Patterson Air Force Base. The area has attracted both computer software development companies and defense contractors.

R&D Lab Space Absorption

Absorption of R&D space on the Mound will be influenced largely by the status of activity at Wright-Patterson Air Force base. Assuming that more R&D functions are allocated to the Wright Laboratory, the overall health of the R&D space market will be enhanced, creating spin-off development that the Mound could capture. Depending on the availability of facilities and testing equipment, Mound lab spaces might capture regional absorption of up to 25,000 square feet. However, the actual rate of R&D space absorption will be based on market potentials in several high-tech industrial sectors in which the Mound facilities were/are active. If markets that the Mound currently specializes in prove too small, or if the operating costs for Mound research facilities are prohibitively expensive, absorption will be considerably lower. Below-market lease rates will also need to be offered as an incentive.

Business Incubator Space Development

Business incubators provide subsidized office or industrial space for infant businesses that need extra financial help to get started. The Dayton Department of Economic Development is planning to build a 60,000 square foot incubator on an old General Motors site. The future building, planned for opening in December of 1997, will be geared toward high-tech start up firms. Although MMCIC does not have designated incubator status, the rent levels currently charged to a portion of Mound tenants are low enough to create the same incubator effect. A proportion of new start-up businesses at the Mound were formed by DOE employees. City of Kettering officials indicated that a third incubator may be created at the DESC facility in Kettering, depending on the extent of leasing activity at the site.

Office Development Trends

While industrial markets in the Dayton area have largely recovered from recession in the early 1990s, the local office market has been slow to recover, primarily due to corporate restructuring at firms such as NCR, which has reduced overall demand for office space. The impact of a national economic recession, coupled with over-building in the late 1980s, has resulted in high vacancy rates for CBD and suburban office space since 1990. The Dayton CBD office market overall has suffered particularly in recent history with overall vacancy of roughly 19% out of a total inventory of 4.6 million square feet, according to the GEM Real Estate Group. Within the total CBD inventory, Class A space vacancy has improved considerably, from over 12% in 1994 to about 8.5% in 1995. Improvement in CBD class A space vacancy came at the expense of older buildings as tenants have traded up for better space at comparable lease rates. As a result, Class B and C space vacancy in the CBD market stood at roughly 26% in 1995 showing slight improvement over 1994 levels. Current net lease rates for suburban office space range from $6 to $14 per square foot, with operating costs contributing an additional $3.50 to $4.00 per square foot depending on building age, condition and location.

Table 9 highlights the amount of office space built in suburban markets between 1950 and 1995 noting current market vacancy for space built during each period. The suburban office market inventory studied by ERA included roughly 6 million square feet of space with an estimated market vacancy of about 9%. Table 9 also shows the extent of overbuilding which occurred in suburban office markets during the mid-to-late 1980s real estate boom.

Table 9: Suburban Dayton Speculative Office Space Inventory Growth and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
before 1950	40,584	3,500	8.6%
1950 - 1959	95,289	5,500	5.8%
1960 - 1969	554,227	37,959	6.8%
1970 - 1974	372,181	94,243	25.3%
1975 - 1979	543,809	65,429	12.0%
1980 - 1984	765,557	94,943	12.4%
1985 - 1989	3,375,188	231,496	6.9%
1990 - 1992	124,138	0	0.0%
1993	0	0	0.0%
1994	40,620	22,620	55.7%
1995	75,000	0	0.0%
Overall	**5,986,593**	**555,690**	**9.3%**
Uncounted	308,207	80,735	26%

Note: Data excludes medical and professional office space
Source: GEM Real Estate Group and Economics Research Associates

The table indicates that roughly 3.4 million square feet of office space was built in suburban markets between 1985 and 1989; current vacancy for space built in this period is minimal, about 7%. The increment of office inventory growth between 1985 and 1989 now accounts for roughly 55% of total suburban office space inventories. Table 9 also highlights that fact that older suburban office product, built before 1984, exhibits higher vacancy. Office space built between 1975 and 1984, which totals roughly 1.3 million square feet, was roughly 12% vacant in 1995. For space built in the 1964 to 1974 period, roughly 925,000 square feet, current vacancy is roughly 14%.

Table 10 highlights the analysis of vacancy by year built for the southern submarket of Dayton which includes Miamisburg and Kettering. The table shows that the southern submarket contains roughly 3 million square feet of space, or about 50% of total suburban office inventories. Indicated market vacancy for space in the southern submarket is about 9%. It is notable that about 53% of the total inventory in Table 10 was built between 1985 and 1990 which is consistent with the surge in office construction that occurred at the national level. In

addition, office construction in the southern submarket between 1985 and 1990 accounted for almost 50% of total suburban office construction during that period. Table 10 indicates that the office space built in the 1985 to 1990 period is highly marketable, achieving a vacancy rate of roughly 8%. Office space built in the preceding five years (1980 to 1985) is apparently less competitive, with a vacancy rate of almost 20%.

Table 10: Southern Office Submarket Speculative Office Inventory and Vacancy Trends, by Date of Construction, 1995

Time Period	Square Footage Built by Period	Vacant Space by Building Age	Vacancy Rate by Building Age
Before 1959	114,974	6,000	5.2%
1960 - 1969	346,237	28,859	8.3%
1970 - 1974	251,752	28,268	11.2%
1975 - 1979	447,972	57,300	12.8%
1980 - 1984	198,712	37,920	19.1%
1985 - 1989	1,627,529	128,574	7.9%
1990 - 1992	49,870	0	0.0%
1993	0	0	0.0%
1994	0	0	0.0%
1995	35,000	0	0.0%
Overall	**3,072,046**	**286,921**	**9.34%**
Uncounted	183,252	23,120	12.6%

Note: Data is based on a 1995 GEM Real Estate office surveys.
Source: GEM Real Estate Group and Economics Research Associates

When taken in context with a depressed office leasing market after 1990, the stark contrast in vacancy rates for space built before versus after 1985 is significant in that it indicates that office tenants were able to move into new office space at attractive lease rates. The data also indicates that space built before 1970 is competitive, with only 34,000 square feet vacant (7%) out of a total inventory of 461,200 square feet. The fact that older office space appears competitive in the

southern submarket is relevant with respect to the Mound, which has over 200,000 square feet of office space built between the 1950s and late 1980s.

Office development has occurred at several locations in the Dayton suburbs. The I-75/I-675 area has emerged as a primary office node, anchored by three principle developments: the Lexus-Nexus headquarters, Prestige Place and the Newmark Office Center. The Lexus-Nexus headquarters is a multi-story, campus style office development with frontage on I-75 south of I-675. The Newmark Center is a business park development, further north along I-675, containing single story flex/office and multi story office space. The Prestige Place development contains two multi-story office buildings and vacant land at the interchange of I-75 and Route 725. Older suburban office development concentrations are located along Kettering Boulevard and South Dixie Highway in Kettering.

Office Space Absorption Discussion

The local office market is still in a period of recovery due to considerable overbuilding in the late 1980s as well as corporate restructuring in the early 1990s which reduced overall demand for office space. The southern office submarket inventory grew by over 3 million square feet over this time period. According to 1995 GEM real estate data, total suburban office absorption in 1994 was about 167,000 square feet. The southern submarket captured about 46% of total suburban absorption over the same period, roughly 65,000 square feet. Based on Table 10, office space construction in the southern submarket occurred at an average rate of 172,500 square feet per year.

Current information supplied by MMCIC officials indicates that the majority of Mound office space will not become available until 2005 when DOE is expected to vacate. Given annual submarket absorption of 167,000 square feet, ERA assumes that the Mound would capture annual absorption of up to 25,000 square feet of office space, primarily for Mound space which comes on line by 2000. Beyond 2000, realistic projection of market demand is risky at best, considering that office space under DOE control may not be maintained properly through the interim. In general, the Mound office space inventory suffers from generally inefficient and inflexible floor plans with the oldest administrative space built along single corridors with double-loaded office spaces. The offices also lack modern amenities including individual-room controlled HVAC.

Highest And Best Use Discussion

The highest and best use analysis is an important component of a standard commercial property appraisal. The analysis examines a given property from two perspectives, "as is" and "as if vacant," to determine if the current use of a property is appropriate and to identify the most ideal use for a property, if vacant. The standard criteria used to analyze the two perspectives are financial feasibility, physical possibility, legal permissibility and maximal productivity. In most cases, the "as is" and "as if vacant" conclusions should be the same. For the Mound, however, analysis of the "as is" and "as if vacant" perspectives will return completely different answers, due to the unique nature of Mound activities over the past 40 years.

The Mound facility was developed in the 1940s for testing and assembly associated with nuclear weapons. When first developed, the property was relatively isolated from residential and commercial development. According to historical records, one reason for selection of the Mound site was its unique geology, comprised primarily of solid bedrock with minimal top soil. However, the site, which now has been in use for over 40 years, has become contaminated with radioactive waste. Current estimates for remediation of the Mound to an industrial level of safety are roughly $1 billion. Although the character of the area surrounding the Mound has become more residential and commercial-oriented, estimated costs to remediate the property to residential development standards would be far in excess of $1 billion. For this reason, redevelopment of the site for residential development was not considered due to the prohibitive cost.

The consultant team examined the redevelopment potential of the Mound and concluded that market potential exists for reuse as an industrial/R&D park. The reuse strategy would involve selective renovation and demolition of existing space, reorganizing the facility to better respond to market dictates. The plan assumes that roughly $45 million is invested to repair, renovate and upgrade Mound facilities in order to create a marketable site. The industrial/R&D park strategy is considered the highest and best use of the site, primarily because it works within the limitations created by environmental constraints, financial/political realities and local economic development goals.

Valuation Methodologies

There are three techniques for valuation of commercial property: the cost approach, the comparable sales approach and the income capitalization approach. Selection of the appropriate valuation method for a given property is driven by physical factors including property type, age, condition, use and location, as well as market factors, such as absorption, vacancy and space demands. Although each approach is driven by different data sources, the resulting value conclusions are often consistent unless the property in question is being impacted by environmental, physical, locational or financial problems. For troubled properties, the valuation estimates returned by each approach for a single property may vary considerably. Typically, a commercial appraiser will generate value estimates from a minimum of two approaches and then reconcile the two values to a final value conclusion. Identified below are explanations of the methodology for each approach:

- The **Cost Approach** is based on the assumption that property value is a function of building replacement cost and land value, less accrued physical, functional, economic and locational depreciation. The cost approach is generally used to value newer property because construction costs are known and depreciation is negligible. Use of this approach on older properties is problematic because depreciation estimates for older properties are highly subjective.

- The **Comparable Sales Approach** is based on the assumption that the value of a subject property is related to the values of similar properties which have sold recently. An appraiser would examine a pool of comparable properties which recently have sold and adjust their values for locational, physical and other differences to derive a value for the subject property. The method requires detailed information about comparable sales including financing terms, conditions of sale, buyer and seller information, transaction prices and property rights transferred. The sales approach is most effective where a large number of similar properties are sold in the market area. However, for specialized facilities, the sales approach can be highly problematic because the unique attributes of a property can make comparative adjustments with other market properties in the area highly subjective.

- The **Income Approach** is based on the premise that, "because improved real estate is capable of producing a flow of income over its economic life, investors will pay a present value for that flow of income that will provide them with a competitive return on capital invested in the property."[vi] The capitalization rate, which is the rate at which the income stream for a commercial property is valued, is effectively a measure of risk and financial

return for investors; higher capitalization rates provide the possibility of better returns on investment but also carry a greater risk of loss of principle. There are two generally accepted methods for valuing a property with the income approach: Direct Capitalization and Discounted Cash Flow.

1. The **Direct Capitalization** method is used generally for low-risk investment-grade income-producing property which has (or soon will) achieved stabilized (consistent), year-to-year occupancy and net operating income (NOI) levels. In this method, a stabilized year expected NOI is capitalized at a given rate, currently between 8% and 12%, resulting in a value conclusion which represents the investment value of a property's revenue stream. The resulting value indication can be converted to a net present value depending on the point in time when the property reaches a stabilized NOI.

2. The **Discounted Cash-Flow** (DCF) method is used typically for properties which may have inconsistent NOI or occupancy levels in the future. The method estimates the value to an investor of holding a property for a longer period, anywhere from five to ten years or longer and then selling the property at the end of the holding period. The resulting value estimate is a present value sum of annual NOIs over the holding period plus the present value of the property when sold at the end of the holding period. The DCF approach incorporates a discount rate to measure the relative impact of inflation, the opportunity cost of money and risk to an investor over the holding period and a direct capitalization rate to value the property at the end of the holding period.

If the Miamisburg Mound were a modern business/industrial park, built perhaps in the early 1990s, valuation would be relatively straightforward. The property would likely be valued using a reconciliation of the sales comparison and income capitalization approaches to value. However, it must be emphasized that the Mound is not a normal property for the following reasons:

- First, the property has a 40+ year history associated with nuclear weapons R&D and assembly making it truly unique both in the Dayton market and nationwide.
- Second, expansion of Mound facilities as the role of the facility changed over 40 years resulted in a arrangement of buildings which met unique DOE needs but left the facility with parking and building arrangements which are now inadequate and not competitive with private-sector development in the Dayton area.

- Third, a majority of Mound facilities were built before 1970 and need to be upgraded to modern safety, health and design codes in order for the property be competitive (and legal) in the Dayton market.
- Fourth, although DOE has identified the year 2005 for final release of the Mound, the extent of nuclear waste on the site has yet to be fully quantified, making the 2005 estimate uncertain.

The four reasons outlined above make the choice of valuation approaches for the Mound clear. It is ERA's opinion that the cost approach would be inappropriate to value the Mound because the wide variation in age and condition for Mound facilities makes depreciation estimates highly subjective. Even if selective renovation and demolition of facilities occurs, the cost approach would be limited by the fact that necessary improvements would only create value in the property rather then enhance existing value in the property. The sales comparison approach for Mound valuation has limited use because the Mound is a unique facility with difficult parking arrangements, buildings that would not be replicated in today's market and wide variation in the age, condition and size of existing improvements. The extent of physical differences between Mound facilities and market-area properties would tend to make judgment of comparability highly subjective. Given the highly unusual characteristics of many buildings, comparable sales are likely to be non-existent.

It is ERA's opinion that the income capitalization approach to value would be the only appropriate method to derive a value for the Mound for the following reasons. Financial analyses for the Mound redevelopment strategy identified likely space absorption rates, operating expenses and supportable rent levels for the Mound, assuming that the necessary initial investments are made to modernize the Mound facilities and site. The financial analysis accounts for the probability of delayed absorption, reduced rental income for Mound space over the forecast period and market risks associated with environmental contamination. Further, annual NOIs for the redeveloped facility are conservative and supportable. The resulting pro forma, highlighting revenues and costs between 1997 and 2010, offers defensible data for use in the generation of value estimates based on discounted cash-flow and direct capitalization analysis. Components of the pro forma discussion in are in the next section.

Pro forma Analysis

The level of success achieved in creating a viable reuse strategy for the Miamisburg Mound is a function of physical and economic factors. The Mound site is handicapped by a variety of physical problems including functional obsolescence, inefficient utilities and poor parking arrangements, as well as radioactive and chemical contamination. Following the dictates of federal law,

DOE is responsible for the environmental remediation for the Mound. In addition, a DOE grant to MMCIC is covering a portion of infrastructure refit and operating costs for the redevelopment effort. However, preliminary cost estimates for necessary infrastructure improvement exceed current DOE financial commitments. In order for the site and facilities to be marketable to the private sector, building and infrastructure improvement and environmental remediations are absolutely necessary.

In an effort to define the redevelopment potential of the Mound, three alternative development options were created. Each alternative explored a distinct redevelopment style, moving from a pure industrial park to a hybrid with both industrial and technology space, to a pure R&D facility. A financial model was developed for each option by ERA to forecast the profit-loss position of MMCIC on an annual basis between 1997 and 2010. After extensive financial modeling, it was determined that hybrid or mixed use R&D and industrial park was potentially feasible from a financial perspective.

Support for the mixed use park was based on research of commercial real estate market conditions in the Dayton area as well as extensive engineering and planning studies of the Mound site and improvements. The engineering and planning studies conducted by URS and Sasaki Associates established the amount of existing industrial, R&D and office space as well as vacant land that has redevelopment potential. ERA analyzed commercial real estate market trends in the Dayton area to derive a set of lease rates as well as space and land absorption levels appropriate to the Mound's position in the market.

This analysis identified achievable lease rates for refitted Mound space basing them on the results of field work in the Dayton area, inspection of different office, industrial and R&D properties and surveys of local real estate brokers to acquire current lease and operating expense information. The information collected during field and survey work was synthesized and compared to information and assumptions regarding the condition of existing Mound facilities as well as timing of environmental remediation and facility renovation. The table below highlights estimated Mound rents for 1997 and 2000 along with comparative lease rates for office, R&D and industrial property in the Dayton real estate market.

COMPARISON OF MARKET RENTS AND ACHIEVABLE MOUND RENTS			
Market Segment	**Market Rents**	**1997 Mound Rent Estimate**	**2000 Mound Rent Estimate**
Suburban Office (Net)	$5.00-$12.00/sf	$3.50/sf	$4.00/sf
Industrial (Net)	$3.00-$4.50/sf	$3.50/sf	$3.50/sf
R&D (Net)	$8.00-$12.00/sf	$3.50/sf	$4.00/sf
Land per Acre	<$60,000/Acre	NA	<$20,000/Acre

Absorption rate estimates for refitted Mound office, industrial and R&D facilities were based on analysis of published real estate data from local and national sources compiled for the Dayton market. ERA's estimate for absorption rates for Mound space reflects conclusions concerning the competitive position that the Mound could achieve in the second option with regard to target markets, Mound investment levels, income goals and the impact of rents on leasing over the forecast period. Based on these analyses, ERA identified two absorption rates for Mound space over the forecast period. The initial absorption rate for 1997 and 1998 assumes an annual rate of 50,000 square feet for industrial space. Beginning in 1999, as renovation of Mound facilities continues, ERA has assumed that rates of absorption for Mound facilities will increase as shown in the table below. The following table outlines absorption estimates for each property type for the Dayton area and for the Mound.

COMPARISON OF CURRENT ANNUAL ABSORPTION IN THE DAYTON MARKET AND ESTIMATED ABSORPTION IN 1999 FOR THE MOUND		
Market Segment	Dayton Area Absorption Rates	Mound Absorption Rates
Suburban Office (Net)	170,000 Square Feet	25,000 Square Feet
Industrial (Net)	300,000 Square Feet	50,000 Square Feet
R&D (Net)	70,000 Square Feet	25,000 Square Feet
Land per Acre	12 Acres per Year	2.5 Acres per Year[1]

[1]Vacant land absorption on the Mound is forecast to begin in 2002

In addition to rent and absorption indices, ERA studied current and forecast budgetary information from MMCIC to determine appropriate operating cost levels for the Mound during redevelopment. Forecast operating costs included payroll and benefits, marketing, utilities, maintenance, consulting services, insurance and space carrying costs. The analysis assumed that the Mound would

charge net rents to tenants who also would be responsible for pass-through expenses.

In developing the financial model, ERA determined that there were three critical factors which will have a significant impact on the profit-loss position of the MMCIC over the forecast period. The three factors are:

- Delayed Absorption: ERA determined that delayed space absorption was possible due in part to the existence of radioactivity on the site as well as the fact that infrastructure refit of Mound facilities would be absolutely necessary in order for the facilities to be marketable. Delays associated with construction or funding appropriation also would delay absorption. In order to account for the likelihood of delay, the preferred alternative financial analysis includes delayed absorption rates for 1997 and 1998.
- Operating Cost Control: The financial model compared utility costs for space used by MMCIC and DOE and determined that each party would save money over the long-term if Mound facilities are taken off the central utility system and refitted with individual heating and HVAC. The financial model assumes that facilities that DOE and MMCIC agree to keep or reuse will be fully converted to separate utilities by 2002. We forecast that net rental rates for the Mound would decline between 1997 and 1998 to account for excessively high tenant utility cost pass-through. It is assumed that, as space is converted to individual systems, tenant utility costs will decrease to market rates, allowing for appreciation in rental rates.
- Infrastructure Cost Sharing Responsibility: During preliminary financial analyses, ERA evaluated the financial ramifications if MMCIC is directly responsible for covering the costs of building and site renovation. One conclusion of the analysis was that, although rates of absorption and operating cost levels have a significant impact on financial feasibility, potential costs associated with infrastructure improvement for which MMCIC may or may not be responsible will be the deciding factor in determining overall financial feasibility of conversion. ERA determined that a large portion of the total estimated cost of site and infrastructure refit, roughly $45-$50 million, is insupportable by cash flows that the Mound could generate over the forecast period.

Key Assumptions:

- Effective lease rates for mound space were reduced between 1997 and 1999; the average 1997 net rental rate fell from $4.25/square foot to $3.38/square foot. After 2000, rental rates would increase at pace with inflation. Between 1997 and 2000, rental rates gradually increase as individual heating and HVAC systems are installed in buildings allowing utility pass-through rates to decrease. As the utility pass-through decreases, effective rents can increase.
- Average MMCIC salary is $50,000.
- Already leased inventory of 178,000 gross square feet through 1997 with an additional 350,000 gross square feet leased from 1998 through 2001. After a three year period during which very little additional space is made available, an additional 200,000 gross square feet is leased from 2005 through 2010. Although the analysis does assume the potential for some delay in the availability of space for lease, significant delays will negatively impact financial performance.
- Beginning in 2002, 5 acres of land will be developed every two years. Assuming an FAR of .3, this is an additional 65,000 square feet for each two year period. As a joint venture partner MMCIC receives a show of this income.
- Insurance pass-through costs of $0.20 cents per square foot.
- Vacancy and credit loss is assumed to be 8% of annual potential gross income.
- Tenant improvement allowance is driven by annual absorption, a weighted average allowance of $7.75 per square foot is used. It is assumed that as space is renovated, the cost of tenant improvements will decrease as the space will be more functional.
- Administrative costs per employee of $10,000.
- DOE utility costs for sub-tenants identifies the utility costs charged to MMCIC for sub-leasing space to tenants.
- Professional services costs decrease incrementally from $400,000 annually to $50,000 annually between 1997 and 2010.
- Inflation is 2%.
- Annual wages are inflated at 2.5%.
- Rents inflate at 3% after 2000.
- Utility cost inflation is at 2%.

- Space carrying costs are driven by an assumed occupancy rate of 92% for MMCIC space at any given time. Costs associated with carrying vacant space are for heat and maintenance.
- Pass-through utility cost is assumed to be $2.88 per square foot. MMCIC officials indicated that this is the typical rate passed through for utilities and common area maintenance charged to their tenants.
- Infrastructure cost phasing is as follows: Building refit for DOE vacated space begins two years after it is vacated (1995 space is refitted in 1997). HVAC improvements are made over three years from 1998 through 2000. Other costs are divided in thirds and spread over 1997, 1998 and 1999.

Implications:

- MMCIC: Using a conservative absorption rate, MMCIC is forecast to achieve positive cash flow in 2002. Positive cash flows between 2002 and 2005 are forecast to remain between $500,000 and $800,000. Strong positive cash flows (in excess of $1 million annually) are not forecast to begin until 2006. Roughly $2.6 million of the DOE subsidy is forecast to remain unused after 2001.
- DOE: Although DOE would be responsible for environmental and infrastructure refit costs, they would avoid being tied to the Mound indefinitely and absorbing carrying costs for vacant space.

Valuation Estimation

Assumptions

The valuation estimates generated for the Mound property are based on one fundamental assumption which relates to the estimated cost for renovation of existing facilities for health, safety and building code compliance (about $45 million), as well as costs of independent HVAC systems and other site improvements. Specifically, the valuation estimates assume that Mound renovation will be completed prior to MMCIC acceptance of the Mound.

To highlight the magnitude of infrastructure investment which is required to convert the Mound into a marketable commodity, ERA generated a benefit/cost ratio analysis of the forecast operating expenses, revenues and infrastructure costs under the proposed reuse plan. The benefit/cost ratio analysis divides the present value of all costs into the present value of all benefits to arrive at a ratio which demonstrates the relative financial viability of a project. If the resulting ratio is less than 1, the project is financially insupportable; if the ratio is greater then 1, the project is likely to be financially viable.

When the present value of forecast operating costs, infrastructure costs and revenues from the proposed reuse plan is analyzed in this framework, the result benefit/cost ratio is 0.338, which is substantially less than 1 and indicative of a project which is insupportable. However, if estimated infrastructure costs are taken out of the ratio analysis, the resulting benefit/cost ratio increases to roughly 1.00, which is indicative of a more feasible project (this assumes that the $45 million investment in infrastructure and code improvement is incorporated into the process of clean-up and conversion for economic reuse). The present value calculation tends to increase the impact of up-front costs compared to revenues, which occur later in the forecast and are, therefore, discounted more heavily. Although the benefit/cost ratio is not a perfect analysis tool for determining financial feasibility, it does demonstrate that, unless up-front investment is made to renovate facilities and improve HVAC systems, redevelopment of the Mound is financially insupportable. ***The valuation estimates shown below specifically assume that infrastructure investment and environmental remediation are both funded and occur in a timely manner.***

Direct Capitalization Valuation Estimate

Generation of a value estimate based on direct capitalization requires three key pieces of information: an income capitalization rate, a stabilized net operating income (NOI) and a discount rate. The income capitalization rate appropriate for the Mound must reflect real estate conditions in the Dayton area as well as unusual

development problems associated with the Mound. Specifically, the Mound is not an investment-grade property due to environmental contamination and the need to renovate existing facilities to comply with modern building and safety codes. In addition, the process for cleanup of radioactive contaminants (up to 10 years) and the phased release of buildings by DOE between 1997 and 2005 will delay the redevelopment process. Risk associated with environmental contamination of the Mound is largely offset by a federal law requiring DOE to clean up the site to industrial standards and cover the future environmental liability issues that are related to DOE-caused contamination.

Because the property is not investment grade, a capitalization rate greater then 9% is realistic. However, the property benefits from federal (DOE) guarantees to remediate and cover liability for environmental cleanup; such a guarantee would tend to reduce the risk level of redevelopment, suggesting a direct capitalization rate lower than 12%. Given the risks that a potential investor would take in redeveloping this property, including uncertainty about future income and the history of the site, ERA would suggest that a market capitalization rate of 10% would be appropriate. The discount rate is roughly comparable to the capitalization rate in that both figures are measures of risk. The discount rate, however, factors in the direct costs of inflation and risk as well as opportunity costs of foregone interest. All things remaining the same, discount rates are usually higher then capitalization rates due to the time factor. ERA assumed a discount rate of 12% for these valuation estimates.

Application of the 10% capitalization rate to the projected NOI in 2008 of roughly $2.57 million, from the proposed reuse plan, results in a future market value of roughly $25.72 million for the Mound site and facilities. When converted to a present value, using a discount rate of 12%, the property would have **a present value of roughly $5.2 million**, *after renovation costs of roughly $45 million are invested; the renovation costs must be spent in order for the Mound to achieve a positive market value.*

Discounted Cash Flow Estimate

The Discounted Cash Flow method is particularly appropriate for valuation of income-producing properties which may see considerable variation in operating expenses and revenues over time. The financial analysis for the Mound proposed reuse plan for redevelopment forecasts income and operating expenses for the facility over a 14-year period. The 14-year financial pro forma exhibits significant changes in cash flow for the facility over the forecast period and is, therefore, well-suited to a discounted cash flow valuation approach. Valuation of the Mound with the DCF approach is based on five primary assumptions:

- A discount rate of 12%, as used in the previous methodology;
- A 14-year hold of the property between 1997 and 2010;
- A sale of the property in the 15th year (2011) based on direct capitalization of estimated net operating income less closing costs;
- An income capitalization rate of 10% as used in the previous methodology.
- The operating subsidy, paid to MMCIC by DOE, is excluded from the analysis.

Based on these assumptions, the property would have a **present value of about $4.7 million**, again assuming an investment of roughly $45 million to renovate, repair and upgrade Mound facilities.

Reconciliation

In a standard appraisal, the reconciliation section would examine alternative values for a property and develop a rationale for a final value conclusion. In the case of the Mound, values were derived from two methods (DCF and direct capitalization). The resulting value estimates, $5.2 million and $4.7 million, need to be kept in perspective since the property needs roughly $45 million in direct investment to repair, renovate and upgrade Mound facilities. Of the two value estimates, the DCF estimate of $4.7 million accounts for annual variations in cash flow for the Mound facility and reflects the increased risk associated with holding a property for a long period (15 years). The direct capitalization value cannot directly account for these issues. Thus, it is ERA's opinion that the Mound would have a current value of roughly $4.7 million minus the costs to renovate, repair and upgrade facilities.

Physical Plan

Land Use

The existing DOE facility, known as the Miamisburg Mound (the Mound), has been utilized since the 1940s for nuclear energy research and weapons development. The Mound is located south of downtown Dayton, west of I-75 in the City of Miamisburg in Montgomery County, Ohio, roughly three miles west of the Route 725/I-75 interchange. This interchange brings together a large suburban retail area (including the Dayton regional mall), office and industrial space development and one of the primary industrial corridors for the auto industry and related manufacturers found in the US Route I-75 corridor.

Currently, the Mound is comprised of 306 acres of land. The site features a topographically distinctive mount with elevations varying between 710 feet to 880 feet. It is bordered on the west by the old Miami-Erie Canal bed and contains two lakes and several stands of trees and fields. Planning studies have determined that about 79% of this acreage has development constraints due to poor soils, exposed bedrock and possible contamination. Furthermore, 42% of the site has significant slope constraints. It is estimated that approximately 155 acres, including those already developed plus approximately 40 acres in the southern parcel, are suitable for development.

The Land Use Plan divides the site into ten site parcels designated A through J as shown on the Land Use Zone Plan.

The road network is divided into seven segments, five of which are the spine or major circulation road and two of which are internal to the parcels on the hill. The lettering of the parcels does not indicate the sequence of desired completion. Rather, the parcels represent land use areas and/or building clusters that are interrelated. Until the cleanup and improvements for an entire parcel have been completed, MMCIC should not accept the transfer of that parcel or the buildings within it. While interim leases for selected spaces and buildings can continue, as is now the practice, they should not be transferred for reuse.

Related to each land and building parcel are roadway segments. The roadway segments provide vehicular access to the land and buildings within each parcel. This direct connection of each parcel of land to a new "public" spine road is critical to the financial success of the development of the Mound. Additionally, this spine accommodates the alignment for trunk utilities serving the parcels and the buildings. These, too, must be completed for the parcel they serve. Until the roadway segment(s) serving a land parcel is completed and the utilities serving the buildings are in place, the land parcel should not be accepted by MMCIC. This

assumption includes the necessity for agreements to be in place with the necessary utility providers including water, sewer, electric, gas and communications.

Also, the phasing plan has attempted to match the configuration of the Release Blocks from the Mound Ten Year Plan with strategically related clusters of buildings and land from the Reuse Plan.

Sequence of Parcel Completion

Given the assumption that a land and buildings parcel will not be transferred to MMCIC until all of the cleanup and improvements are completed and until the vehicular access and utility corridors are in place, the final sequencing of the transfer can be negotiated between MMCIC and DOE to best match the pace and character of the market and the scheduling and related costs of the cleanup and improvement work.

Description of Parcels

For each parcel shown on the plan, the following description notes the relationship of the parcel to the Mound Ten Year Plan Release Blocks and the roadway segment(s) that must be completed in conjunction with the parcel and outlines any significant issues related to the release of that particular parcel.

- Parcel A– Building 61

  Land Use: General Industrial

  Mound Ten Year Plan Match: Same as Release Block G

  Access: Completion of spine segment 1 including utility lines and the relocation of the control point will provide proper access to the parcel.

  Issues: The critical action for making this parcel available is the new entry road with related access and parking modifications. The hill behind building 61 should be reforested.

- Parcel B–Lower Parking Area

  Land Use: Research and Development

  Mound Ten Year Plan Match: Almost same as Release Block H with the exception of building GH area

Access: Completion of spine segment 1 is required to give this parcel a "front door," utilities and a clear point of access.

Issues: This parcel is assumed to be developable only after the necessary parking improvements on the hill permit the relocation of the parking. It is further assumed that an MMCIC/developer joint venture or sale of this parcel will not take place until the Mound has exhibited its success in the marketplace and the value of this parcel is established. The reconfiguration of the entry roads and the completion of the spine 1 segment provide an opportunity to accommodate on-site construction fill for realignment of the spine road and the entry road to the Main Hill.

- Parcel C--Main Hill (front)

Land Use: Office, Research and Development and General Industrial

Mound Ten Year Plan Match: Incorporates all of Release Blocks L, O and N and most of P and Q. P is modified to eliminate buildings E and Q to eliminate building 48

Access: Along with spine 1 improvements and utility improvements necessary to serve the parcel, the road and utility network interior to the parcel must be completed. The interior road network is designed to function with a central loop and with cul-de-sacs to limited amounts of parking. After transfer of the back of the hill, the cul-de-sacs will be extended to complete a hilltop road network of interconnected loops. Also considered an access requirement, the parking that is within this parcel must be in place prior to transfer.

Issues: While inclusive of all or part of five Release Blocks, this parcel functions as one. It has one access point and shared parking and will have an interrelated pedestrian network from parking to buildings and between buildings. While assumed to be a multiple user parcel, the interrelationship of buildings and parking does not lend itself to further segmentation. It is likely that it always will remain in a single ownership.

The recommended building demolition and parking construction will create an excellent building site next to OSE, the value of which will be realized after the successful transition of the balance of the Main Hill.

The parcel boundary is configured to permit the "back" of the Main Hill (Parcel I) to be fenced and separately controlled for cleanup beyond a transfer date for this front parcel. It is assumed that access roads to the back of the Main Hill will permit direct connection to the rail and to off-site disposal of radiologically contaminated debris. Relocation of clean debris for on-site fill could use the roadway network within the parcel for access to fill sites.

- Parcel D--Lower A

Land Use: Research and Development and General Industrial

Mound Ten Year Plan Match: Largely the lower, non SM-PP, portion of Release Block F, plus building 22

Access: Access is from the spine road and will require the improvements to the spine 1 and 2 segments with related infrastructure improvements.

Issues: This parcel includes a site for a new building, assumed to be of future potential after the Mound has established value. It also includes a significant land area through which DOE is transporting demolition debris from SM-PP to the rail. Completion of this parcel requires removal of the temporary road and the cleanup and reforestation of the land. Depending upon the timing of the SM-PP cleanup and use of the road, this parcel could be modified to separate out the land north of the temporary haul road for release.

- Parcel E--Test Fire

Land Use: Explosives Research and Industrial

Mound Ten Year Plan Match: Largely Release Block C, less the sewerage treatment plant and building 22

Access: Requires completion of spine segments 1, 2 and 3 which will complete the northern portion of the "loop" road connecting the Mound parcels to Mound Avenue to the north and east and eventually to Benner Road to the south. This alignment also contains the utilities serving the parcel.

Issues: The long term economic use of this parcel is focused upon the existing inventory of buildings. Along with improvements to the spine road, an improved entry and parking configuration is necessary to permit these buildings to function as a unit. Resolution of the long term viability of MMCIC ownership and leasing of the bunkers remains an issue for this parcel. Parcel E also includes a significant portion of the hillside that must be cleaned and reforested.

- Parcel F--Buildings 105 and 100

Land Use: Office, Research and Development and General Industrial

Mound Ten Year Plan Match: Same as Release Block D

Access: The spine 4 segment is required to open parcel F (and parcel G) to a "front door" and viable address on Mound Avenue.

Issues: Assuming completion of the access improvements, this parcel will create a Mound Avenue address for the existing buildings and for a development site adjacent to building 100. This separate address and entrance will permit an identity that is independent of the Mound Main Hill development.

- Parcel G--Overlook

Land Use: General Industrial including flex space

Mound Ten Year Plan Match: Same as Release Block E

Access: Spine 4 provides access to Mound Avenue and spine 5 provides access to the main spine. Additionally, spine 5 is the bounding roadway from which buildings within this parcel can gain access.

Issues: This parcel is a land parcel that should be developed in an MMCIC joint venture or by a developer who purchases the parcel in its entirety. Access and cleanup of the entire parcel, including demolition of all buildings, is required prior to development. It is assumed that development will await the establishment of viable land values upon the successful transfer and reuse of the other parcels at the Mound.

- Parcel H--Lower B

Land Use: Infrastructure

Mound Ten Year Plan Match: Includes Release Blocks I, J and K plus the sewerage treatment plant part of Release Block C

Access: Via a drive off the spine road

Issues: This parcel contains no buildings of direct economic benefit to MMCIC and is not part of the economic model for reuse. As such, the timing of its cleanup and improvements is not directly related to the market. The significant issue for this parcel is the transfer and ongoing operation of the sewerage treatment plant. It is assumed that DOE, with the participation of MMCIC, will negotiate the transfer of this facility to the City of Miamisburg, in which case the private tenants of the Mound will be tied into the municipal system.

- Parcel I--Main Hill (back)

Land Use: General Industrial or Explosives if buildings I and B are reused as currently projected

Mound Ten Year Plan Match: Includes Release Blocks M and P plus building 48 from Block Q and building E from Block P

Access: Via the extension of the roadway network serving Parcel C, Main Hill (front)

Issues: The parcel contains land that, after demolition of buildings and transfer, will accommodate parking necessary for the buildings on the Main Hill. The critical interrelationship with the development

of Parcel C, Main Hill (front), is that the approximately 300-car lot that will occupy the site of buildings E, R and SW will be required before the building site next to OSE can be utilized. That project will displace approximately 300 spaces, which the Parcel I spaces will replace.

This parcel collects what is understood to be the areas of concentration of radioactive contamination and the areas most likely to require the longest time for cleanup. Additionally, it includes a point of connection to the rail for transport of waste. Two buildings that remain within this parcel, B and I, require careful consideration before there is a commitment to their transfer for economic reuse. The two buildings will be unavailable for the market for a long period of time assuming that the cleanup and demolition of buildings E, R and SW will not mix well with access to either buildings B or I. This delay, when added to the requirements for improvements, may result in a conclusion that they are not viable for economic reuse.

An additional consideration for this parcel is that the site of building I could potentially accommodate construction fill, thus creating a future site for a building overlooking the river below; and the WD building site could be a location for an on-site land fill. Engineering studies will be necessary to test the viability as well as to calculate the volume of demolition debris that may be disposed on site.

Whether or not fill is deposited within this parcel, it will require cleanup and grading of the surface of the hill as well as reforestation.

- Parcel I--"South 40"

Land Use: General Industrial including flex space

Mound Ten Year Plan Match: Includes all of Release Blocks A, B and S

Access: Access for land development will be provided from Benner Road. The extension of the spine road through the parcel connecting the northern Mound to Benner Road will be a requirement for the developer of the parcel. Similarly, utility extensions serving the parcel are the responsibility of the developer.

Issues: This parcel will be developed through an MMCIC joint venture or bulk land sale. It is assumed that this step will take place after the Mound is established as a viable place in the market. The critical timing issue with respect to transfer is related to the eastern end of Block S through which the spine road must be constructed by the developer prior to, or as part of, development of the parcel.

Building Use

Within the Mound plant there are approximately 130 buildings consisting of manufacturing facilities, office space, laboratory and research space, explosives research and production facilities, warehouse and storage buildings and maintenance/infrastructure facilities. The earliest Mound improvements, including office, warehouse, explosive storage and research lab space, were built between 1948 and 1970. Since then, additional testing and administrative space has been built with the most recent additions occurring in the late 1980s. These existing improvements contain state-of-the-art testing and analysis equipment that has commercialization potential. Approximately 1.3 million square feet of buildings currently exist on site.

The Reuse Plan for the Mound recommends the retention of 33 buildings totaling 694,600 gross square feet of space. This total does not include the 10 infrastructure buildings totaling 12,600 gross square feet. The Reuse Plan also recommends the demolition of 59 buildings totaling 349,156 gross square feet of space. The plan does not address the 19 buildings totaling 106,810 gross square feet that are in the SM-PP area and remain in use by DOE. These buildings are not part of Reuse Plan study area. The following table summarizes the intended use of each of the buildings.

Building Information Summary

Gross floor area of existing buildings to be reused		**707,200**
Proposed uses		
Office	229,900	
General Industry	180,300	
Research and Development	150,300	
Explosive	134,100	
Infrastructure	12,600	

Buildings not scheduled for reuse by MMCIC		**628,956**
Buildings scheduled to be removed by DOE based on the Mound Ten Year Plan	228,360	
Buildings which have not been scheduled to be removed by DOE based on the Mound Ten Year Plan	120,796	
Buildings within the SM-PP area	106,800	
T Building	173,000	

Note: For a listing of buildings, please see Appendix.

New Construction

Area / Use	General Industrial	R&D	Total
Parcel B (Lower Parking)		200,000 gsf	200,000 gsf
Parcel C (Main Hill)		100,000 gsf	100,000 gsf
Parcel D (Lower A)		40,000 gsf	40,000 gsf
Parcel F (Bldg. 100 and 105)	60,000 gsf		60,000 gsf
Parcel G (Overlook)	150,000 gsf		150,000 gsf
Parcel J (South 40)	290,000 gsf		290,000 gsf
Total	**500,000 gsf**	**340,000 gsf**	**840,000 gsf***

**Space developed by someone other than MMCIC*

All the buildings on the Reuse Plan have been identified by MMCIC and DOE as buildings that are candidates for retention. However, it is understood that there will be an ongoing process of reuse planning that will involve joint MMCIC and DOE discussions about specific buildings and whether or not they should be preserved or demolished.

In addition to the Reuse Plan recommendation that 349,156 square feet of building be demolished, there are a number of buildings that are shown on the Reuse Plan that could be considered for demolition. If the building-by-building cost benefit analysis determines that the economic benefit to MMCIC does not justify the DOE cost of cleanup and the cost of improving these facilities, they could be eliminated without affecting the viability of the Reuse Plan.

Five criteria were utilized in assessing the viability of these additional buildings:

1. The building is "scattered" and/or located relatively remote to the core building groups on Main Hill and Test Fire area. The remoteness will create cost premiums for modifications and improvements to roads, utility systems and for the long term maintenance of these facilities.

2. The building has exceptionally high DOE cleanup costs.

3. The building is very small. Buildings under 5,000 gross square feet are potentially too small to warrant the effort to clean them, improve them and manage them over the long run.

4. The location of the building(s) relative to the radioactive cleanup process determines that viable reuse cannot begin until 2005. This creates a long period for retention of a vacant building with associated costs for deterioration and maintenance as well as obsolescence.

5. The building disposition remains undetermined at this time.

The following buildings are considered candidates for demolition if it is determined jointly by MMCIC and DOE that they be removed.

Building T. The 173,000 square foot, underground building is the subject of ongoing discussions regarding strategies for cleanup and its final disposition. Its removal will have no physical impact on the Reuse Plan. Its removal, however, would likely result in significant impact on the availability and timing of the buildings on the Main Hill. Because it is underground, building T is not shown on the Reuse Plan.

Building 46. It is understood that this 2,400 square foot building on the Main Hill is wanted by DOE for their use in production of heat sources for deep space probes. Because of the building's technological capabilities, good physical condition and central location, MMCIC potentially could reuse this building.

Building 73. This 2,200 square foot gas cylinder storage building in Lower Area A may be of use to tenants of the site. MMCIC will evaluate its long term potential and determine whether it should remain. Its removal is of no planning consequence.

Buildings 80, 81, 82, 83 and 84. These five magazines in the Test Fire area currently are in use by tenants of the adjacent buildings. MMCIC has stated a potential desire for their retention. Final determination will be made during the joint determination of keep vs. demolish. The magazines are shown on the reuse plan, but would not impact the plan if they are removed.

Buildings I and B, while included in the Reuse Plan, may prove unfeasible for reuse because of their location with respect to buildings R and SW. Both R and SW are contaminated with radiological materials and are among the last to be completed (estimated for 2005). Therefore, marketability before 2005 is highly unlikely. Additionally, building I is a particularly specialized building made up of spaces that have a limited market potential. Building B has a high cleanup cost ($181/square foot) and will require significant other improvements.

Buildings I and B could remain as the reuse plan does not require the footprint area of either for success. However, MMCIC should not take ownership of either until the cleanup of the back portion of the Main Hill is complete and both buildings are improved to economically viable conditions.

Buildings 48 and 89 are small (8,000 square feet and 4,800 square feet, respectively) buildings that are located along a road that the Reuse Plan does not recommend improving. In accordance with the plan, the road will have no purpose other that to serve these two buildings. If building I is removed, and the need for the northern end of the road is eliminated, over 1,000 feet of road could be eliminated. Even with the retention of building I, over 800 feet could be eliminated. Given the cost of $150 per square foot to clean up and improve building 48 and $110 per square foot for building 89, both are strong candidates for removal.

If building specific cost/benefit studies demonstrate that these buildings and the roads serving them justify their retention, they can be accommodated in the Reuse Plan. However, their demolition, along with the removal of the related roadway could be combined with the removal of WD and its roads, resulting in an excellent area for an on-site land fill.

Buildings 35, 45 and 22 all have cleanup cost in excess of $1,000 per square foot and are relatively small. These building have 2,500 square feet, 2,800 square feet and 9,100 square feet respectively and are not critical to the Reuse Plan.

Unless the building specific cost/benefit study recommends their retention, they should be removed. Removal will have no impact of the Reuse Plan.

Buildings 94, 67 and 104 are all under 5,000 square feet and have limited identifiable reuse opportunities. These three buildings are 1,200 square feet, 3,800 square feet and 1,800 square feet, respectively. DOE may have temporary requirements for 94 and 104 as part of their cleanup work. Neither has long term value to MMCIC. Building 67 also has limited reuse potential and is located such that it could complicate the construction of the spine road.

Unless the building specific cost/benefit study demonstrates the benefit of preserving these buildings they should be demolished.

Analysis

Should the MMCIC and DOE decide to demolish all of the 13 buildings (counting the magazines as one building) as a result of their building by building cost/benefit analysis, a total of 20 buildings would be remaining for office, R&D, explosive

and general industrial use. Other than building 100, all office (229,900 square feet) would be on the Main Hill, all R&D (127,800) would be on the Main Hill, all of the explosives (69,400) would be in the Test Fire area and general industrial (167,200) would be divided into each of three areas.

This total of 594,300 gross square feet does not include the 12,600 square feet of infrastructure buildings that would be retained as required by the entity assuming responsibility for the utility infrastructure.

This configuration of uses is logically organized and would avoid any adjacencies of office or R&D with the explosive uses that historically were located throughout the site.

The remaining buildings all have DOE cleanup costs under $200 per square foot; most are near or under $100 per square foot. All are over 5,000 square feet with the exception of building 60 which is connected to 28, an over-11,000 square foot building; and building 85 which is new and considered to have excellent reuse potential.

The 13 buildings that are candidates for demolition (counting the five magazines as one building) total 100,300 gross square feet. Of this total, 53,400 square feet of space is contained in buildings B and I. The other 11 buildings total only 46,900 square feet or about 4,000 square feet per building on average.

In addition to the reuse potential of between 600,000 and 700,000 gross square feet (depending upon the number of buildings discussed here that are demolished), the Mound can accommodate an additional 200,000 square feet of buildings on three specific building sites on the Main Hill (Parcel C), Lower A (Parcel D) and SM-MP (Parcel F) areas and approximately 640,000 gross square feet on three land parcels in the lower parking lot (Parcel B), SM-PP (Parcel G) and the undeveloped land to the south (Parcel J). These total to an estimated buildout of the Mound of 1.4 to 1.5 million square feet of development.

Circulation And Parking

Roadways

Reuse of the site requires roads that, like the buildings, are in accordance with public standards and that parking be located in reasonable proximity to buildings. The existing roadway system was designed for a single government user and is not safe for multiple users in a public environment. The reuse plan makes maximum use of existing roadways with selected upgrading to achieve a more marketable standard.

The roadway network is based upon the necessity that each parcel of land designated on the Land Use and Parcelization Plan has direct access to a publicly accessible street. Direct access provides a "front door" and address for each tenant or cluster of tenants and avoids tenants of any particular parcel or area having to drive through another to arrive at their building.

The Reuse Plan provides for a creation of a tree lined "spine road" that enters the site from Mound Avenue at the point of current entry to the Mound, providing direct access to Parcels A and B as well as the connection to the Main Hill, passes through the site accessing Parcels D and E and exits the northern part of the Mound at the road that divides the developed northern part of the Mound from the undeveloped southern Parcel J. The Reuse Plan calls for the spine road to continue on through Parcel J to connect with Benner Road. This portion is to be completed by the developer of Parcel J.

A primary entry to the Mound is proposed for the point of entry from Mound Avenue where the exiting multiple entry roads are combined into one and a landscaped and signed entry gate is created.

When the southern Parcel J is developed, another primary entry should be created serving those who will access the site from Benner Road. It is assumed that the public improvements that have been proposed for Benner Road will be completed by the city and that these improvements will be an important point of access for the development of Parcel J.

A second primary access road from Mound Avenue serves Parcels F and G. This road segment, also featuring trees and an entry sign, along with an improved road between Parcel J and the northern parcels, provides a front door and address to these two parcels while completing a loop off Mound Avenue.

The third principal segment of vehicular access to the parcels at the Mound is the roads serving the Main Hill. While is assumed this segment will be completed in two segments in concert with the improvements to Parcels C and I, when finished, will provide access, addresses and looped access to the buildings on the hill.

Parking

Parking for the Mound is provided by three means as indicated on the Circulation and Parking Plan. The parking plan assumes the requirement for an average of 3 cars per 1,000 gross square feet of space.

The first segment of parking involves the reuse of existing lots. Maximum advantage is taken of existing facilities when they are located within a reasonable walking distance from the buildings they serve. The plan assumes modest improvements to these parking areas including lighting.

The second segment of parking accommodation requires the construction of new lots as part of the cleanup and transfer process. These lots are required in order that the reused buildings can be served with parking within acceptable walking distances. While a single government user could reasonably require employees to walk longer distances, much of the existing parking supply is unacceptable for private tenants who will lease space.

Almost all these new lots, shown on the proposed Circulation and Parking Plan, are located on the site of buildings to be demolished or are modifications to existing lots to permit a sufficient number of cars to occupy the lot.

The third segment of parking is those lots that will be constructed by the developers of new buildings. While these lots are shown in the Reuse Plan in relation to the structures that could be built, they are not built as part of the cleanup and improvement work.

Infrastructure

The Reuse Plan assumes that water, sewer, electric and gas services to individual buildings are provided by outside operators. Water and sewer utilize existing lines with sewers connecting into the existing plant and water connecting into the city supply. Electric and gas service will be installed by the respective utilities via trunk lines assumed to follow the spine road.

Heating and cooling systems at the Mound are powered by the central power plant. As more buildings are shut down and demolished, the utility demand from the central plant will be reduced. The central plant is not cost effective for private and

multiple users because of the labor cost associated with the required 24-hour monitoring of central plant equipment (nearly 3 times higher than newer systems), the significantly outdated chillers/refrigerants and the high energy consumption/low efficiencies. The implementation of decentralized HVAC plants and the decommissioning of the central plant will be required in order that heating and cooling can be provided to the reused buildings at a market competitive rate.

The stormwater management system, including retention areas, requires expansion. The Reuse Plan requires the construction of a stormwater collection system within the improved roadways and the construction of additional stormwater detention capacity.

Open Space

The open space system illustrated on the Open Space Plan is based upon two principal strategies.

The first is to improve and protect the steeper slopes throughout the site by reforestation to prevent erosion and reduce stormwater retention requirements. These areas, undevelopable for the uses proposed for the Mound because of the premiums that would be required to create buildable areas, are the most distinguishing parts of the Mound and offer the potential for creation of a public open space system in a continuation of the open space at Mound Park and the adjoining golf course. While not illustrated on the plan, this open space potentially could accommodate an additional nine holes of golf (to be constructed by private developers) or, in the near term, this space can accommodate walking trails connecting from Mound Avenue though to the open space along Benner Road. It is assumed that this open space will be cleaned up and parts of it reforested as part of the transition of the Mound for commercial use.

The second strategy with respect to open space is to create selectively a campus-like environment within the Main Hill and Test Fire building complexes. These are the two primary groupings of reused buildings and both require this investment in open space amenity as a step in making them viable for commercial reuse. An additional focused investment in the open space is at the site entrance from Mound Avenue. Here, as for the areas within the building clusters, plantings of trees and grass is proposed.

Phasing

The phasing strategy for the Mound Reuse Plan is determined by the fact that there is a ten year period during which MMCIC and DOE both will occupy the Mound, interim leases will be in place with new tenants, cleanup and improvement projects will be underway, and partial transfers of land and buildings could take place. Critical to this time period is that fact that the pace and sequencing of the cleanup and building improvement projects will be driven by technical and fund availability factors as well as efforts to match market absorption pace with available buildings. For these reasons, the phasing strategy is a set of principles or goals, rather that a single timeline for accomplishing particular segments of the cleanup and improvement work.

The financial projections assume that a total of 178,000 gross square feet are leased through 1997, plus another 350,000 gross square feet through 2001 (assuming it is available). The balance of the rental activity resumes in 2005, at which time the majority of leasing activity will be for the DOE office spaces. This space will be available and can be leased at a rate of 25,000 square feet per year. A total of 200,000 additional square feet are assumed to be leased from 2005 through 2010.

Development of the land is assumed to begin in 2002 after which time the market can absorb development of 5 acres every two years. It is further assumed that each 5 acre increment of land accommodates 65,000 gross square feet of space.

Market Driven Absorption and Value Creation

The Reuse Plan assumes that the exiting structures are cleaned and improved for the market prior to any construction of new buildings or land development. This strategy enables the Mound to establish itself as a successful private research and industrial park with existing buildings, and to establish the real estate values associated with that success prior to any ventures to build or develop new space. This assumption leads to the conclusion that Parcel B, the lower parking area, G, the overlook land behind SM-PP, and J, the South 40, will not need to be available for development until 2002 when the financial analysis assumes there could be income from land development.

Contiguous Buildings Create Marketable Areas

The Land Use Plan illustrates ten parcels lettered A through J. Each parcel represents a cluster of buildings or a land area that should be treated as a unit. There will be relatively complex phasing for the cleanup and the tenants will need to coexist with the cleanup process on the Mound. Therefore, the phasing of

cleanup and the phasing of any transfer of ownership to MMCIC should be done in units of land and buildings that match the land use clusters. While interim leases are possible, it should be assumed that DOE will maintain ownership of the land and buildings within a parcel until such time as all cleanup and improvements are made.

The phasing of this turnover should be a subject of the joint MMCIC and DOE meetings at which the cost/benefit analysis is made for the buildings. To the extent the phasing of the cleanup of the parcels can create savings for DOE, the interrelationship of these potential savings and the impact on the financial success for MMCIC should be studied.

Roads and Utilities that Serve Each Parcel

The spine road is designed to provide direct access and a marketable address for each of the parcels. Although existing water and sewer lines are not located within this corridor, it is assumed that the Spine Road will be the location of the gas and electric service, as well as the storm drainage system. It is critical that prior to the transfer of any parcel of land and the associated buildings, the roadway and utility corridor serving the parcel be complete.

Completion of Necessary Improvements Prior to Transfer

Financial success for the reuse of the Mound depends upon the assumption that a number of necessary improvements to the buildings and site are made as part of the cleanup and improvement process. These include bringing the buildings and site into a condition that is in compliance with local codes and policies, completion of outstanding deferred maintenance, accomplishing improvements necessary to make the site marketable, the creation of decentralized heating systems for the buildings, and the demolition of buildings for which there is no economically viable reuse. Consistent with the strategy that land and buildings be turned over to MMCIC in the parcels shown on the Land Use Plan, it will be necessary for all necessary improvements to the building and site within the parcel be completed. It is assumed that building and site specific improvements can be phased to parallel the cleanup phasing and that the conversion of the heating and cooling to decentralized systems can be planned and scheduled to complete that conversion as soon as possible. The financial analysis for reuse of the Mound assumes that the heating and cooling conversion begins in 1998 and is complete by the end of 2000.

Summary of Estimated Costs

Cost estimates for the capital improvements were developed for the preferred reuse plan. The following assumptions and table outline the methodology used to develop the estimates.

- All environmental clean-up costs will be the responsibility of the DOE and are not included in the estimates.
- All buildings and site features must be improved to a standard sufficient to be in accordance with local building codes and standards.
- All buildings and site features must be improved to a level of repair sufficient for economically viable reuse.
- Building systems must be such that operating costs are market-competitive.

The cost summary is based upon planning assumptions and it is important to note the estimates are to an "order-of-magnitude" accuracy and do not reflect detailed analysis of existing conditions or detailed designs of building systems or building and site modifications. Prior to execution of any of the work outlined in the plan and estimated in these summaries, more detailed engineering studies and estimates will be required.

Estimates are organized into site related and building related costs.

Site Related Costs

- Potable Water
  The existing SM/PP water tower can continue to be used and will be connected to the main Miamisburg city water system in its medium-pressure district. It is assumed that the city's water treatment plant will be expanded commensurate with additional water requirements. A new water line will be added to serve the south end of the site and will be connected to an existing 12-inch main line.

  The Mound water wells can be used to provide fire-water. The fire-water pumps and storage tanks will be maintained.

- Waste Water Treatment
  Waste water flow estimates are developed on the basis of four categories of facility use (office, laboratory, light industrial and storage). The existing Mound waste water treatment plant will be utilized but will be limited to application on the north end of the site.

It is assumed that the Miamisburg city waste water system will be used for utilization by the south end of the site. The Miamisburg city pump stations can be expanded, if necessary, to fulfill this need.

- Electric
  It is assumed that DP&L will take possession of the site distribution system. The costs to modify the system for separate services including duct banks and meter installation is estimated. Costs include construction of communication upgrades and relocation of overhead circuits for the utility services to underground.

- Gas
  Gas costs are estimated for meters and extension of gas service from mains to the new boilers. It is assumed that the utility will install gas lines in the roadway corridor, as required, to serve the development.

- Stormwater
  Current USGS maps were used to determine drainage areas. The Rational Method was used in calculations. A 10-year frequency storm was used to determine rainfall intensity. Duration of the storm was assumed to be equal to the time of concentration for preliminary calculation purposes.

  For preliminary calculations, the three existing retention/detention ponds were assumed to be unable to contribute to stormwater storage. Excavation/grading costs are based on standard unit cost per volume of material. Lump sums (non-detailed component costs) are used for the unit costs of the control structures in the proposed ponds.

- Road Improvements
  The City of Miamisburg standard is used for road widths thus necessitating the widening of existing roadways. The use of existing roadways will be maximized through use of techniques involving reconstruction, asphalt mill/overlay and asphalt mill/joint repair/overlay. New construction is provided as required. Storm drainage is estimated for all roadways.

- Roadway Lighting
  Assumes standard cost per linear unit for general "ODOT" type lighting.

- Parking Lot Lighting
  Assumes standard lighting cost per area based on the generally accepted illumination standard for parking lots.

- Demolition of Stanchion Lines
  These demolition costs are for removal of the existing overhead lines. It is assumed that this distribution system will be replaced by building-specific heating and cooling systems. Air is not replaced and is the responsibility of building tenants.

- Parking
  Shared parking areas are assumed rather than separate parking lots for each building. Since new development usually requires separate parking lots, this may require a variance from the Board of Appeals. Alternatively, the plan may need to comply under Planned Unit Development (PUD) standards. This assumption permits maximum utilization of existing parking areas. Miamisburg city standards are used for the determination of the number of spaces per area of industrial, R&D and office space. Standard construction unit cost per area is utilized.

- Landscaped Areas
  Recognizing that the image of the site will become increasingly important as the site is converted from public use (DOE) to private use, the mixed use plan has budgeted money to create and refine formal landscape treatment in specific locations. These improvements involve demolition and removal of selected paved surfaces to create spaces with natural materials including grass, shrubs and shade trees. It also is envisioned that walks and pedestrian paths within formal landscaped areas will be paved with a relatively high quality material that will help distinguish these areas from the rest of the site.

  Inspection of the site identified the fact that much of the undeveloped areas of the property, particularly on the Main Hill, are covered with either pavement or gravel. It is envisioned that some of these areas will be restored to a more natural landscape. This would include removal of gravel or paved surfaces and planting with meadow grasses and a limited number of trees and determination that soils do not contain hazardous materials.

- Environmental
  No environmental clean-up costs are included. It is assumed that all environmental corrective actions that may have an impact on the disposition of the buildings and site will be corrected as part of the existing Site Closure Plan. These are identified in the 13-volume *Environmental Appraisal Reports of the Mound Plant, March 29, 1996* and all appropriate *Phase I Environmental Site Assessment of DOE Mound Facilities* reports.

Asbestos-containing material (ACM) and lead-based paint (LBP) will be disposed as identified in various reports. Barge, Waggoner, Sumner and Cannon (BWSC), *Mound Asbestos Survey, May, 1993*; BWSC, *Mound Asbestos Management Plan, September, 1993*; PEI Associates, Inc. (PEI), *Inventory and Assessment of ACM in Buildings of the EG&G Mound Applied Technologies Facilities, March, 1989*; and Tremco, Inc., *Thermocore Analysis, October 27, 1995*.

Building Related Costs

Costs to Bring Buildings Up to Code: An estimated cost to bring buildings up to code was developed based upon a review of existing data describing the Mound buildings and their condition, a site visit to confirm conditions and identify deficiencies, the preparation of a "characterization" of the condition of each building, and the preparation of an order of magnitude of cost estimates associated with required levels of improvement. Required architectural improvements include modifications to fire alarm annunciation systems, emergency power systems, accessibility signage, hardware, toilet rooms, elevator controls and signals, egress stairs and related construction demolition. Plumbing, mechanical and electrical improvements that are code-related include back-flow preventors required on domestic water service entrances, floor drains in the manufacturing and laboratory buildings that presently are attached to the storm sewer system and must be plugged or rerouted to the sanitary sewer system, increased fresh air capacity for ventilation systems, and replacement of electrical water coolers to meet ADA requirements.

A change in ownership from DOE to MMCIC will not necessarily trigger the requirement for code compliance. Additionally, so long as there is no change in use, there will be no trigger for requiring code compliance; however, there are several critical reasons for bringing the buildings and site up to a compliant condition prior to transfer.

- While a "first new use" may avoid the requirement, the long-term reuse plan for the Mound must address the condition of the buildings and site.

- The determination of whether a change of tenant is a use change can be made only at the time of application for an occupancy permit. If determination is made that a new proposed use is a change, MMCIC will incur significant costs and time delays.

- Any additions or modification and improvements to the buildings that are determined by the code office to be significant will trigger a need for compliance.

- A change to multi-tenant use may involve a change to mixed use versus accessory uses, triggering code requirements.
- Because the purpose of codes is related to life safety issues, it is imprudent for a public owner like MMCIC to assume the potential liability of owning and leasing facilities that do not meet current health and safety standards.
- Tenants, who must assume responsibility for the safety of their employees would be hesitant, if not unwilling, to lease space that does not meet health and safety standards.
- The rents that are achievable for the buildings at the Mound, even after all proposed improvements are in place, are not sufficient to permit MMCIC to finance the cost of the necessary code improvements. The long-term and "end state" for a successful reuse must assume the need for buildings and site to be improved to a code-compliant level.
- Completion of the improvements to the buildings and to the site that are required to make reuse economically viable must be a condition of acceptance of the facilities by MMCIC from DOE.

HVAC Improvements: The financial analysis of the preferred reuse plan demonstrates that the achievable rent levels will not support the cost of utilities delivered from the central plant. The relatively high operating cost of the central plant, coupled with a significant reduction in the number of square feet to be serviced, results in utility cost per square foot that is almost twice what is achievable with a decentralized system. The savings are enough to pay for the decentralized system in less than 10 years. The plan assumes the conversion of the heating and cooling system to individual buildings or to clusters of contiguous buildings.

The heating/cooling demands for each building were developed based on the potential utilization as administration (office), laboratory, light manufacturing or storage. Decentralized heating and/or cooling plants are estimated for individual and, when appropriate, clustered buildings. As a result of utilization of the cost of individual components, costs for decentralized boiler plants and air-cooled chillers are estimated at a range of capacities.

These estimates include steam boilers and associated feed water equipment and pumps; steam and condensate piping to connect to existing distribution piping within the buildings; air-cooled chillers and associated pumps and piping as required to connect to existing distribution piping; incidental plumbing; insulation, controls; and an allowance for mechanical rooms/buildings to house boilers and associated equipment, pumps, etc. The boilers sized at 100 horsepower and above

are to be "Ohio Special" fire tube boilers and will not require 24-hour surveillance by a licensed boiler operator.

Deferred Maintenance: Deferred maintenance costs are those costs necessary to bring buildings to a level of repair suitable for economically viable reuse. These costs are largely the consequence of the deferral of maintenance of roofs, windows and building envelope. This evidently has resulted from decisions to avoid costs associated with maintenance of soon-to-be-closed and/or transferred buildings. These estimates are based upon observations of the buildings, determination of their general condition and a professional assessment of the order-of-magnitude of maintenance needs. Estimates range from $1 per square foot for the newest buildings to $10 per square foot for buildings requiring new roofs and windows.

Building Demolition: Buildings that are identified in Mound Ten Year Plan for demolition are not included in the cost estimate, i.e., they have been removed or will be demolished and costed under the Mound Ten Year Plan.

Buildings that are identified for demolition in this study are assumed to be clean. The cost to render the building clean is included in the Mound Ten Year Plan.

The demolition cost for additional buildings that are removed in order to ensure the marketability of the site is included as appropriate. These are buildings whose final disposition is categorized as "sell" in the Mound Ten Year Plan (i.e., the Mound Ten Year Plan premise is that the buildings will not be demolished), but the MMCIC has requested that they be demolished. Demolition costs have been estimated at a unit cost of $10 per square foot of building area.

Total Construction Cost Plus Contingency: To the total of the site and building costs is added a design and construction contingency of 25% to reflect the potential for additional costs that will be identified as the design of modifications is prepared and as unexpected conditions are discovered during construction. It is anticipated that, as the level of specificity of design is increased, this contingency can be reduced.

Indirect Costs: To the total of costs and contingency, an additional 25% in "soft costs" is added to reflect the non-construction costs of fees, testing and project management.

Additional Tenant Improvements: This is an allowance for costs that will be incurred by the MMCIC as they seek to lease the properties to tenants demanding a higher level of "finish" of space than the basic level of improvement necessary to bring the buildings up to code compliance, operating efficiency and a basic usable condition. These costs do not include a contingency because they reflect what is an allowance required in the market. It is assumed that space improvements beyond this allowance will be the responsibility of the tenant. Note that site improvements that are assumed to be necessary to meet the higher levels of market are estimated as part of site costs. They must be expended independent of the leasing arrangement and must, therefore, be assumed as development costs.

Cost Information Summary

SITE RELATED COSTS

Item	*Projected Cost*
Water/Waste water	$825,000
Electric	$1,500,000
Gas	$400,000
Stormwater-Detention	$275,000
Stormwater-Sewer etc.	$1,360,000
Road Improvements	$1,101,000
Road Lighting	$232,000
Parking	$906,000
Parking Lighting	$297,500
Site Lighting	$101,500
Demolition of Stanchion Lines	$400,000
Formal Landscaped Areas	$1,268,000
Natural Landscaped Areas	$1,375,000
Subtotal	***$10,041,000***

BUILDING RELATED COSTS	***Projected Cost***
Item	
Cost to Bring Buildings Up to Code	$7,546,000
Plumbing/Electrical Upgrades	$336,000
HVAC Improvements	$5,708,000
Deferred Maintenance	$3,400,000
Building Demolition	$1,207,000
Subtotal	***$18,197,000***

TOTAL CONSTRUCTION COST	**$28,238,000**
Design and Construction Contingency 25%	$7,059,500
Subtotal	***$35,297,500***
Indirect Costs (Soft Costs) 25% of construction and contingencies which includes fees, testing & project management	$8,824,500
Subtotal	***$44,123,000***
Budget for Additional Tenant Improvements Above Code Upgrades	$4,173,000
TOTAL OF ALL COSTS	**$48,296,000**

DESIGN GUIDELINES

1.0 Introduction

The physical plan prepared as part of the Miamisburg Mound Comprehensive Reuse Plan provides a framework for managing the implementation of the MATC. As a step in the implementation of the Reuse Plan it is assumed that the City of Miamisburg will enact a zoning provision that creates a special planned development zone for the Mound. It is further assumed that that there will be a development review process for all projects to be accomplished within the zone. Through a special permit process, the City will assume the power of review and approval for all projects within the zone. This review and approval process will be guided by the Comprehensive Reuse Plan, along with a set of Design Standards, which should be formally adopted by the City as the basis for their review and approval of proposed projects.

The focus and purpose of the Design Standards is to establish an overall site structure built upon a spine road with its entrances from Mound Avenue and Benner Road, and an open space system of reforested hillsides and a more campus like character within the development clusters. Additionally, the standards can be used to establish a pattern of new buildings and parking that reinforces the structure of the spine road and the open space.

A significant amount of the site and building improvements will take place during the period of DOE managed cleanup , assumed to extend until at least 2005. Also, it is anticipated that there will be a phased transfer of ownership of buildings and related parcels of land over the period of time. The design standards should apply to all stages of work at the Mound. Section 2 of the standards addresses the building, site, and utility system condition that must be achieved prior to transfer of the property from DOE to MMCIC. Section 3 addresses the specific process of review and approval after ownership has been transferred from DOE to MMCIC. It is assumed that the standards provided in sections 4 thorough 9 will be used by the MMCIC and City as they work with the DOE as part of the joint MMCIC and DOE process of building improvement and transfer design, and will apply to City review of projects that take place after the transfer.

The Design Standards and the related review process propose that the review and approval will be accomplished by a "Design Review Committee" (DRC) to be established by the City of Miamisburg and the MMCIC. The DRC will be the reviewing body which will ensure the proper conformance of an "applicant" (DOE, MMCIC, a joint venture including the MMCIC, or a public or private entity seeking to develop a portion of the Mound) with the Reuse Plan the Design Standards.

2.0 Building and Site standards for Acceptance by MMCIC

A key recommendation of the Comprehensive Reuse Plan is that only those buildings or site areas with economic reuse potential will be designated for reuse and that they will be transferred to MMCIC in a condition that permits such use. Building and site conditions that are acceptable for economic reuse are as follows:

Buildings

Building envelop maintenance will be complete with particular attention to roofs, windows and walls.

Code standards will be complete for building systems including entries, stairs, hallways, doors, toilet rooms, signage and alarm systems.

HVAC systems will be installed for individual buildings or clusters of buildings as determined to be most cost effective.

Utility connections and metering for individual buildings will be installed for water, electric and gas systems.

Site

Area storm drainage systems, including reforestation of open slopes, that are acceptable to community standards will be in place.

Spine roads and interior roads with community acceptable widths, curbs and walks, lighting, landscape, and storm drainage will be in place.

Parking areas that have adequate numbers of spaces, and that are located within reasonable walking distance of buildings to be retained, will be in place.

Utilities

Utility corridors and trunk lines for gas, electric, water, sewer and communications will be in place.

Sewer and water system agreements with the city will be in place.

Electrical and gas supply agreements for necessary installation and transfer of lines and meters will be in place with the appropriate local utility companies.

3.0 Architecture and Site Design Review

3.1 Review Process

Plan approval by the Design Review Committee (DRC) is required prior to the undertaking of any site improvements, construction or installation, including clearing, grading, paving, signs, structures, landscaping, building additions or alterations, and subdivisions. Review should be coordinated with required governmental approvals.

Submission to the City of Miamisburg for building permits or site plan approval should not be made until Preliminary Plans have been approved. Site clearing and grading can begin after Preliminary Approval and proper governmental clearances have been granted. Actual construction starts, such as excavating or concrete foundations, should not commence until Final plans have been approved by the DRC.

All submissions to the DRC are to be made in duplicate. The review of each submission by the DRC will be carried out within ten (10) working days from the date of each submission; and notification of recommendations or approval will be provided in writing to the applicant at that time.

3.2 Three-Stage Process

Upon the transfer of ownership of buildings and site areas to MMCIC, plans for proposed new buildings, significant modifications (costs in excess of 50% of the value of the building) to existing building, or to significant site improvements (roadway and parking upgrades and construction) must be submitted to the DRC for review and approval at the following stages of planning and design. Prior to the transfer of buildings and sites, during which time the City and MMCIC do not have jurisdictional control, the standards listed below will be used by the city and MMCIC as a basis for review of proposed DOE cleanup projects.

I. Schematic/Preliminary
II. Construction Documents
III. Certificate of Compliance

At each state the following elements shall be considered:

Site Plan
Building Design
Landscaping

Signs may be submitted and reviewed simultaneously with, or separately from, the above elements.

Two sets of plans shall be submitted for each review.

Stage I. Schematic/Preliminary Review

This stage is intended to demonstrate compliance with the Special Permit requirements of the City of Miamisburg planning and zoning by-laws.

Thus, the site plan will include at least the following:

Site location
Grades, existing and proposed
Site survey
Building location, overall dimensions and height
Setbacks, buffers, etc.
Landscape areas
Site lighting plan
Connections to existing utility lines
Site Drainage
Projected number of employees
Amount and location of parking
Truck loading and service areas.

Building Design:

Floor plans
Elevations, in color or with color samples
Perspective rendering (optional)
Building materials
Preliminary review shall be concerned with:
building materials, colors, and finishes, architectural treatment and rooflines.

Stage II. Construction Documents

Working drawings and specifications reflecting the approved schematic/preliminary plans are submitted for review and approval.

Design revisions occurring after Construction document approval by the DRC shall be subject to review and approval by the DRC.

Stage III. Certificate of Compliance

A Certificate of Compliance is issued to an applicant upon completion of construction. The Certificate of Compliance provides assurance to the applicant that the requirements of the protective covenants have been met, and also provides assurance to the applicant that building(s) has been built or modified according to plans approved by the DRC.

At the time an applicant desires to apply for a Certificate of Compliance inspection, they will complete a checklist and forward it to the DRC. This should be at the same point that application is made for a Use and Occupancy Permit from the City of Miamisburg. The completed checklist, signed by the applicant, will indicate compliance with the major items listed below, pursuant to the plans approved by the DRC. Where items usually related to landscaping cannot be installed before occupancy, the checklist will indicate a completion date. One full planting season will be the maximum time permitted. Violation of this deadline will be considered as a violation of the covenants.

The following items, and the following items only, will be covered by the Certificate of Compliance inspection:

Building(s) is located according to approved site plan

Building(s) is of approved architecture and approved color.

The approved landscaping has been installed.

The approved lighting has been installed.

The approved signs have been installed.

Air conditioning, utility equipment and trash collection areas have been screened according to approved plans.

4.0 Project Development Standards

4.1 Land Use

Permitted uses are as established by the City of Miamisburg Zoning Regulations for the Mound Development Zone. The primary uses established for the development zone are light industry, research, and office.

4.2 Land Coverage

Land coverage standards allow for coverage by impervious surfaces (buildings, walks, drives and paved areas) consistent with the building footprint and parking areas illustrated in the Mound Reuse Plan.

4.3 Intensity of Site Development

The development intensity of the site shall not exceed that illustrated in the Mound Reuse Plan unless it can be demonstrated that additional square footage and the related parking can be accommodated without negatively impacting the amount and quality of open space.

5.0 Building Design

5.1 Overall Approach

It is intended that a basic harmony of architecture shall prevail among the several buildings so that no building shall detract from the attractiveness of the overall environment.

The architectural character of each proposed building or structure shall be contemporary rather than traditional in style.

5.2 Materials

Colors, materials, finishes and building forms should be sensitively integrated with existing buildings and the particular landscape and topographical character of the site.

The exterior walls of each building are to be constructed of durable, permanent materials as approved by the DRC.

No temporary or inflammable materials will be approved. Painted concrete and cinder block may be acceptable when executed to achieve a texture or decorative effect that is integral to the design of the building.

6.0 Parking, Service and Access

6.1 Parking Ratios

All parking, loading, and unloading areas must be sufficient to serve the business being conducted within a particular development area. The following criteria are minimum guidelines. More stringent requirements may be imposed if warranted by the intended use.

All parking required for the development of a district will be provided within the district parcel in keeping with recommended ratios. For already developed areas, it is assumed that parking can be shared.

- Office and Research: 1 space per 300 square feet gross office or research use.
- Light Industrial: 1 space per 450 square feet gross light industrial use.

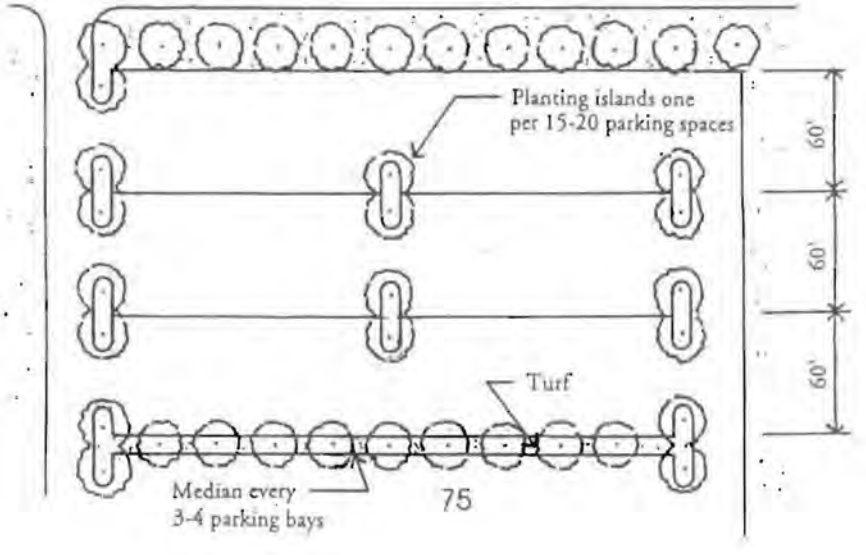
6.2 Site Criteria for Parking

No parking or other vehicular surface will be closer than 20 feet to a building line except in the case of an automobile drop-off, a loading area, vehicular entry into the building or within already developed areas where this amount of separation is not feasible.

6.3 Landscape for Parking

Parking areas will be subdivided by islands containing trees or other landscape materials. The following elements will be required:

- Planting Island: one per 15 to 20 spaces
- Medians: one every 3 or 4 bays



6.4 Materials

All parking lots, driveways, and walks will be surfaced with bituminous concrete, brick, or an approved equal material. Lighting for walks, driveways, and lots will be as specified (see Lighting).

6.5 Service

All exterior service loading, storage, and utility areas (including transformers, cooling towers, etc.) will be located at the side or rear of the building and will be screened or sheltered so as not to be visible from the street right-of-way or from adjacent parcels. No material, supplies or equipment may be permitted to remain outside any building.

Adequate loading and maneuvering space will be provided for each use, separated from the parking areas.

7.0 Lighting

The purpose of site lighting is twofold: (1) to illuminate and (2) to provide security. Lighting should be provided at important organizational points, in areas that receive heavy pedestrian or vehicular use and in areas that are dangerous if unlit, such as stairs and ramps, intersections or abrupt changes in grade.

It is important that lighting be placed in a logical and appropriate relationship to the site. Unless light is put where it is useful, the expense of increasing foot-candle levels is wasted. The following provides color, size, scale, light intensity and placement standards.

Pedestrian Walkway System: Light color should be natural (metal halide); semi-concealed source; 12 foot maximum height; dark poles; .8 lumen average per square foot surface area.

Parking Lot and Service Areas: Lighting should be cool, concealed source and cut off design. Light color should be natural (metal halide). Fixtures should be between 20 and 30 feet high with dark poles and 1.0 lumen average per square foot of surface area.

Roadways and Intersections: Lighting should be cool, concealed source, cut off design with 1.2 lumen average per square foot of surface area. Light color should be in the blue end of the spectrum as in deluxe white mercury. The light source should be between 30 and 50 feet high on dark poles. Along major roadways pole

spacing should be 120 feet along both sides of the roadway. Spacing along minor roadways should be 90 feet along one side or staggered.

Buildings: Well-designed, soft lighting of the building exterior will be permitted, provided that the light source is not visible and that it complements the architecture. The light color should be blue - white as in fluorescent lighting. The lighting should not draw inordinate attention to the building.

8.0 Signage

Entrance signs for the MATC will be installed and maintained by MMCIC.

Free-standing identification signs should be erected at the entrance to each parcel or district at a location deemed to be suitably visible and appropriate by review and approval of the DRC. The identification signs will be fabricated with durable, weather-protected materials and finishes, in accordance with the following criteria:

> **Posts**: Tubular steel, anodized aluminum or wood in square cross-section not to exceed six inches by six inches.
>
> **Panels**: Steel, anodized aluminum, or wood rectangular face, bracketed by the posts at the ends, not to exceed five feet six inches in height and with a minimum vertical clearance above grade of two feet.
>
> **Finish Color of Posts and Panels**: Dark brown Lettering: White Helvetica medium. Corporate logos may be used in conjunction with the standard letterings.

An identification sign will be permitted on the exterior of the building at a location related to the principal entrance and subject to review and approval by the DRC. It may be attached flush to the building surface or in a free-standing position, provided that it is integral with the architectural design of the building. Signs will not project significantly from the building wall except as required for an attachment structure or back lighting. No sign will be permitted to project above the roof or parapet elevation. No moving or flashing signs will be permitted.

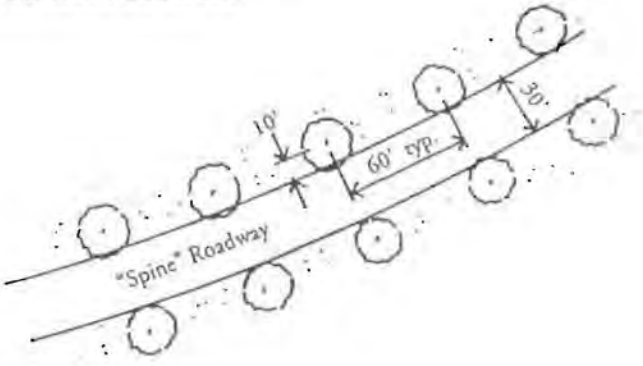
Directional, traffic or parking control signs on the site will be reviewed by the DRC, with the intent that the signs will be restricted to the minimum necessary, will be visually unobtrusive, and will be consistent in format, lettering, and coloring.

9.0 Planting

An important element of the design of the MATC is the selection, organization and use of planting. Plant materials should be used to provide continuity for the site. All areas not covered by the building, parking and walkways are to be landscaped according to the guidelines outlined here.

9.1 Major "Spine" Roadway

It is particularly important that the plantings for the spine roadway be uniform throughout the site. The roadway will be lined with trees planted 60 feet on center. The palette of plant materials used in other areas, access drives, parking and related land areas, must complement the plantings used along the spine road and the natural vegetation on the site.



9.2 Reforestation

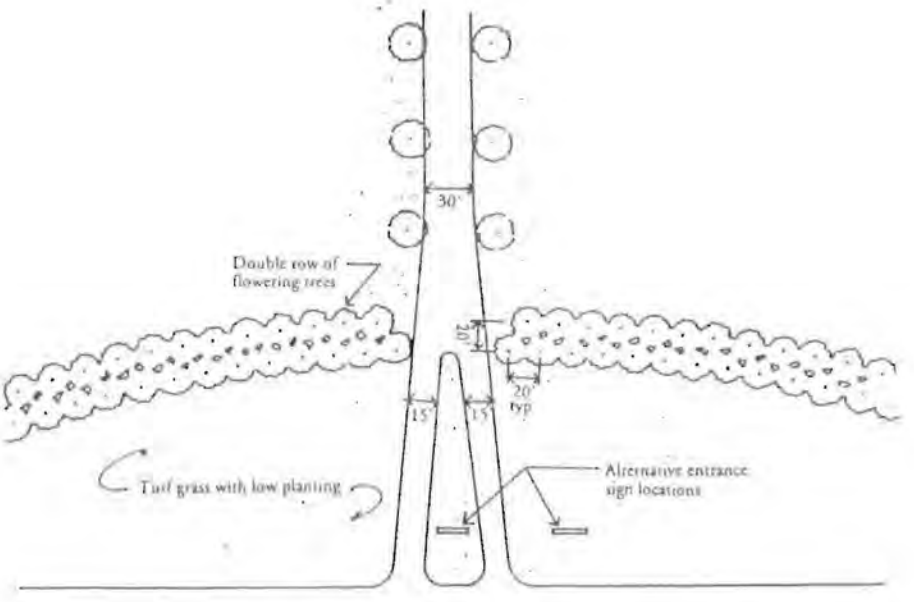
The hillsides of the Mound are generally covered with grasses and deciduous woods. Preservation of existing planting will reduce the need for new material. In areas where roads and buildings have been removed, as well as areas where site development has resulted in open and unprotected slopes, a reforestation program should be implemented. A mixture of species consistent with the existing natural areas is recommended. Planting of small seedlings will provide erosion protection and an aesthetic benefit over time.

9.3 Court Yards

Three courtyards serving existing buildings are identified on the Reuse Plan, two on Main Hill and one on Test Fire. Others are recommended to be designed for proposed building clusters. Simple grass surfaces and tree groupings are recommended to create an attractive outdoor gathering place and building setting.

9.4 Site Entry

Three primary site entries are identified on the Reuse Plan. One at each end of the spine road linking Mound Avenue and Benner Road, and a third at the point of entry to buildings 100 and 105 and the overlook areas. Site entry planting for the main spine road should consist of a simple arc or grouping of trees defining the entry, grass and low planting, and an entry sign for the MATC.



Miamisburg Mound Reuse Plan

Transition Plan

MIAMISBURG Mound COMMUNITY IMPROVEMENT GROUP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

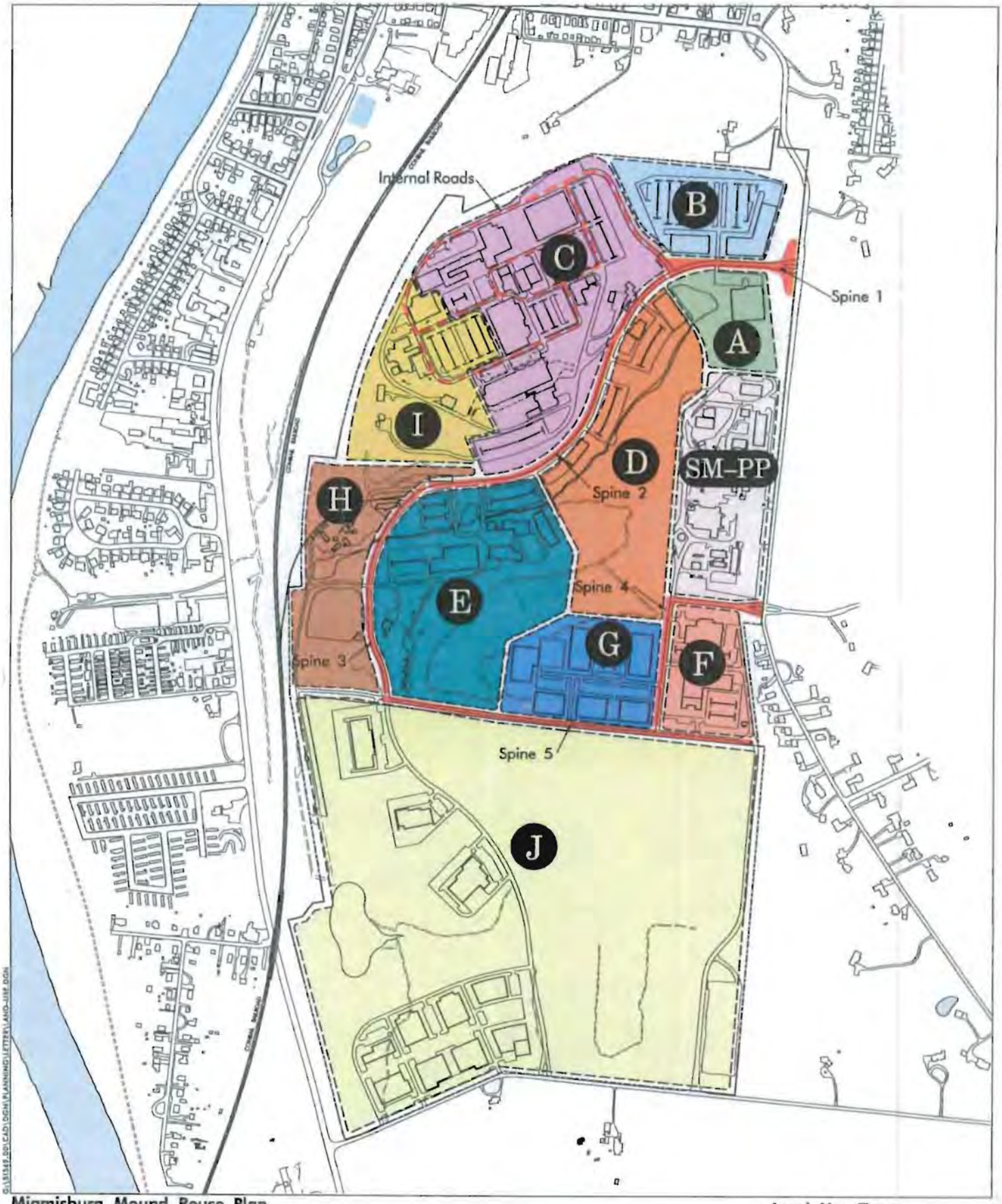
Legend

- Surface Water/Wetlands
- Lawn /Old Fields
- Trees
- Existing Mound Buildings
- Paved Surfaces
- Aquifer

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Land Use Zones

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

- Parcels
- Spine Roads
- Internal Roads

December 1996

N

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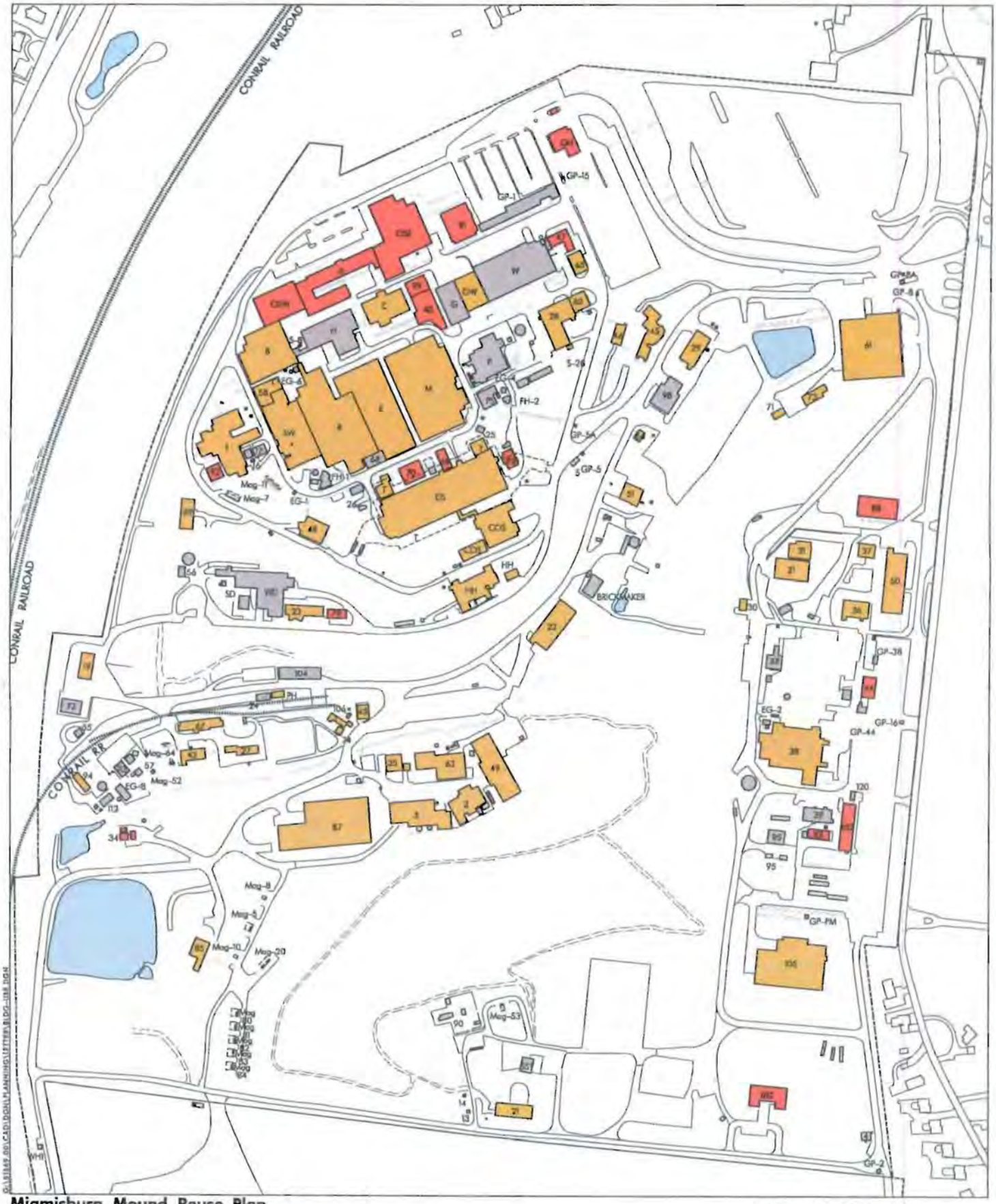

Miamisburg Mound Reuse Plan

Existing Building Use

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

- Lab /R&D /Lt. Industrial 930,640 GSF
- Office /Administration 281,900 GSF
- Storage /Support/Service 132,160 GSF

December 1996

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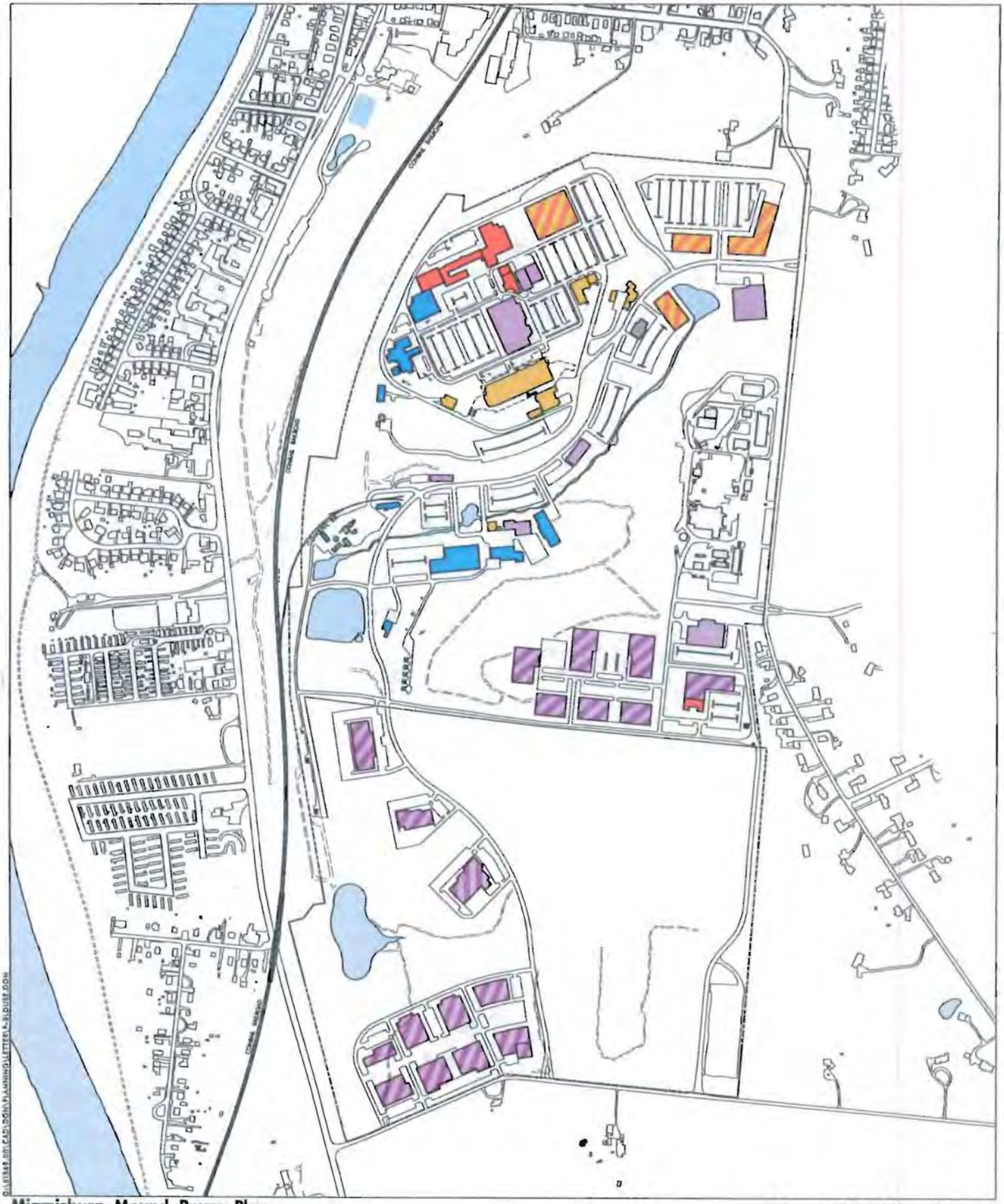
0 200 400



Miamisburg Mound Reuse Plan

Proposed Building Use

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

Buildings to be Reused	Potential New Buildings	
		Office
		R & D
		Explosive
		General Industry
		Infrastructure
		SMPP

December 1996

N

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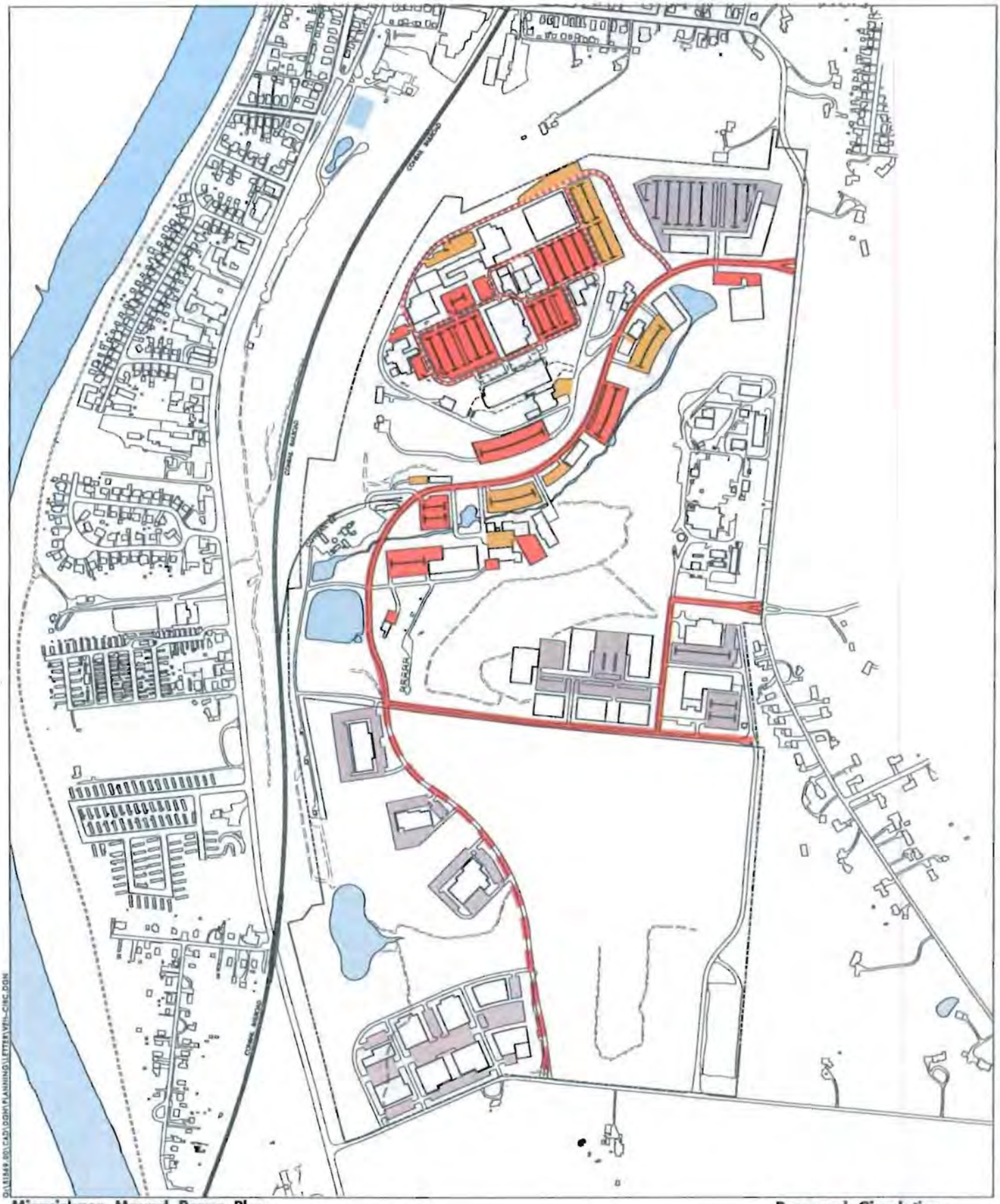

Miamisburg Mound Reuse Plan

Proposed Circulation & Parking

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

- Existing Parking
- Proposed Parking (Reuse Plan)
- Proposed Parking (By Others)
- Spine Road (Reuse Plan)
- Spine Road (By Others)
- Internal Roadways

December 1996

N

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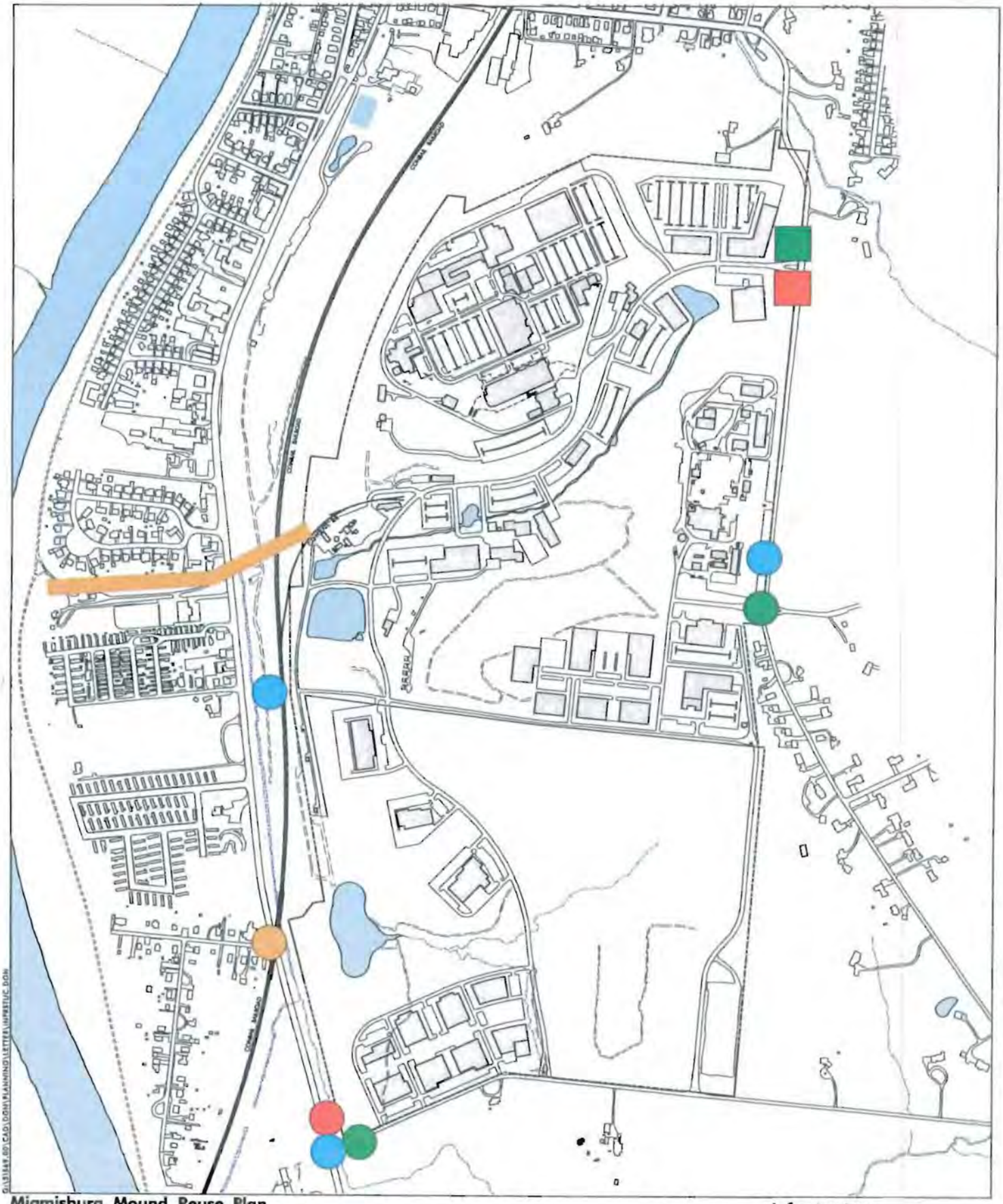

Miamisburg Mound Reuse Plan

Infrastructure

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

Existing Connection	Proposed Connection	
		Natural Gas
		Sanitary Sewer
		Electrical Supply
		Water Supply
		Existing Sewer Outfall from Treatment Plant

December 1996

N

0 375 750

Miamisburg Mound Reuse Plan

Open Space

Legend

- Existing Fields and Woodlots
- Reforestation
- Landscape Features

December 1996

0 375 750

Miamisburg Mound Community Improvement Corp.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Implementation And Management

Introduction

Unlike the standard military bases going through the conversion planning process in preparation for final base closure and reuse implementation, MMCIC is conducting the Mound planning process concurrently with incremental implementation activities, as DOE scales back their operations and completes environmental remediation. In this chapter, we have outlined some of the more salient features of this unique, but necessary, implementation approach, including organization and management, funding, property acquisition, personal property, marketing, and an action plan, which outlines steps for MMCIC to take in the near-term to effect reuse of the Mound. This chapter also highlights factors which the consultant team believes to be critical to the successful redevelopment of the Mound.

Management and Organization

The MMCIC has a dual role in the redevelopment of the Mound. Its first role is to ensure that the property is converted to its best use, achieving the economic development objectives of the community, and replacing the economic and fiscal losses that are being effected by the closure of the facility. The second role is to ensure that environmental remediation takes place in a timely manner, and leaves the property in a state that will allow the highest and best use to be achieved. Since environmental remediation is a critical component of the reuse process, MMCIC must provide oversight, working with DOE and the site contractor to insure that schedules are met and goals achieved during the estimated 10-year clean-up period. The oversight role, which is separate from the economic development role, is a significant financial burden for MMCIC.

The current MMCIC organizational structure is well suited for its dual responsibilities, including planning, as well as implementation needs. It is our belief that the organization, if it is to assume long-term responsibility for transition, must have both the skills and capabilities of a private organization as well as a municipal or quasi-public entity. These skills and capacities include the following:

- lease or sell property
- enter into contracts
- acquire additional land
- provide financing for potential users
- accept government grants
- market, promote, and handle prospects

It is our opinion that, although the MMCIC already has these capabilities, over the longer development period, additional tools, such as tax increment financing techniques, may be needed for the development of the *South 40* property.

Given the dual roles that MMCIC has assumed in Mound redevelopment, the future success of the project and its implementation will be highly dependent on a number of factors, one of which is the qualities and skills of the people in charge. The policy and direction will continue to be created by the board, with input from the community, and as the goals and objectives continue to evolve, they must be carried out by the professional staff. Currently, this staff has combined responsibilities of planning, redevelopment, and government liaison. Although, over time, the MMCIC organizational structure is likely to remain consistent, the organizational focus will likely shift from planning to implementation and management roles.

Activities that must be part of the future mix include project conceptualization, development planning, financial analysis, property management, government relations, capital formation, marketing and advertising, etc., as well as oversight related to environmental remediation, communication with stakeholder groups, and management of fixed assets. As we have indicated in our financial analyses and business plan, it will be important to carry out these activities in a cost effective manner, with a lean-and-mean management team. At the very least, the following staff positions will be necessary:

- **President,** who will oversee management, prospect development, assist in the planning and budgeting process, evaluate policies and procedures, communicate with the media, and interface with the board and the City of Miamisburg officials.

- **Vice President**, who will responsible for budgetary issues, MMCIC operations, lease structuring, and other related operational planning areas.

- **Director of Finance,** who is responsible for the financial functions of the development programs. This will include maintaining ongoing automated financial accounting systems, ensuring compliance with federal funding programs, maintaining all accounting files, manages payroll and accounts payable, overseeing coordination and maintenance of invested funds, preparing monthly financial reports, assisting in audits, studies and evaluates internal control procedures, overseeing personnel records, coordinating insurance requirements and functions, and performing other duties as needed.

- **Marketing** The MMCIC has already developed marketing materials and conference capabilities which will require updating and reorientation as the reuse plan progresses. Other responsibilities will be direct marketing to business prospects, maintaining a liaison with other industrial/economic development organizations, attending conferences, and negotiating with prospects.

- **Office Administrator,** for production, typing, filing, communications, etc.

In addition, given the complex nature of environmental contamination on the site, as well as the multiple stake-holders who are involved in the redevelopment process, MMCIC will likely need:

- **Planning Manager,** who oversees site redevelopment, including physical planning, environmental risk assessment, and reuse plan coordination.

- **Commercial Property Manager**, who will oversee property leasing, sales, and construction activity on the site. This manager would also work with potential tenants to access state and federal resources.

- **Equipment Manager**, who will oversee the acquisition, use, maintenance, and management of Mound equipment.

The MMCIC may want to maintain a development attorney on a retainer.

Funding Sources

State and federal funding programs are available to potentially cover a range of needs for the Mound, including infrastructure refit, road, water, and sewer improvements, and business development, if DOE is unable to cover the entire redevelopment cost. Although ERA has identified a variety of state and federal sources that should be considered and pursued, we cannot guarantee that any of these identified sources will provide sufficient funds to offset all or a portion of the Mound's renovation needs. Since there are a substantial number of closing military facilities around the country seeking economic assistance, the extent to which the Mound is identified as priority at the state or federal level will influence the increment of funding which is accessible. State and federal funding sources are discussed below:

State

The Ohio Department of Development Technology Division administers the Defense Conversion Assistance Program. This program is designed to aid

communities respond to adverse economic conditions caused by Department of Defense cutbacks. Miamisburg has already received funds from this program for planning and implementation activities. MMCIC could receive additional funds from this program, or other state agencies.

Although state grants tend to be relatively small compared to federal sources of funding, state funding would still be useful on a smaller scale, possibly to cover tenant build-out costs and related business development expenses. Given the unique nature of redevelopment issues associated with the Mound, the state, which has a general role of job creation, would also be in a position to enact special legislation to finance Mound redevelopment as well. The state could be in a position to enact special bonding or tax increment financing authority, which could be used to offset redevelopment costs.

Federal

The following section identifies possible federal funding sources for defense conversion and economic development. One potential source of funds is the Economic Development Administration (EDA) of the Department of Commerce. The EDA has programs designed to "alleviate conditions of substantial and persistent unemployment and underemployment in economically-distressed areas and regions of the nation, to address economic dislocations resulting from sudden and severe job losses, and to administer the Agency's programs." EDA funds can also be used for situations where military downsizing occurs, i.e., where defense contractors reduce operations or move elsewhere. EDA's funding priorities follow those of the Department of Commerce, which includes the following applicable to MMCIC:

- The commercialization and deployment of technology, particularly information technology and telecommunications, and efforts that support technology transfer, application, and deployment for community economic development;
- Sustainable development which will provide long-term economic development benefits, including responses to economic dislocation caused by national environmental policies (hazardous waste clean-up, etc.), as well as projects involving reuse of "brownfields."
- Entrepreneurial development, especially local capacity building, and including small business incubators and community financial intermediaries (e.g., revolving loan funds); and
- Economic adjustment, especially in response to base and federal laboratory closures and downsizing, defense industry downsizing, and post-disaster, long-term economic recovery.

MMCIC could possibly draw from Defense Economic Conversion programs. The EDA programs listed below all qualify under this program group. $90 million has been appropriated to this fund for fiscal year 1996; as of June 1996, $17 million has been obligated thus far.

Program:	**Special Economic Development and Adjustment Assistance Program - Sudden and Severe Economic Dislocation (SSED) and Long-Term Economic Deterioration (LTED)**
Organization:	**Department of Commerce - Economic Development Administration**
Purposes:	To develop and implement strategies to address problems stemming from sudden and severe economic dislocation such as plant closing, military base closures and defense contract cutbacks, or long-term decline in an area's economy. Funds may be used for: plan development; capitalization of revolving loan funds; financing the construction of public facilities; technical assistance or training.
Eligible applicants/ beneficiaries:	Usually, counties or consortia of counties.
Range:	Maximums of $300,000 to $1,000,000, depending on type of project
Source:	*Government Assistance Almanac 1994-95*

Program:	**Economic Development - Grants For Public Works And Development Facilities**
Organization:	**Department of Commerce - Economic Development Administration**
Purposes:	For the construction of public facilities to support the development or retention of permanent jobs in the private sector in areas experiencing severe economic distress - e.g., water and sewer systems, industrial park access roads and other infrastructure, port facilities, railroad spurs, public tourism facilities, vocational schools, renovation and recycling of old industrial buildings, business incubator facilities. Projects must be consistent with approved Overall Economic Development Programs. Grants cover basically 50% of costs, with a 10% bonus available for redevelopment areas in Economic Development Districts; federal funding may be increased to 80% in severely depressed areas, and to 100% for designated Indian reservations. (Note: this program's funding includes funds available for the Public Works Impact Program.)
Eligible applicants/ beneficiaries:	States, cities, counties, other political subdivisions; Indian tribes; private or public nonprofit organizations or association representing a redevelopment area or a designated economic development center. Available also in U.S. territories and possessions.
Range:	$80,000 to $2,317,000
Average:	$743,000

Source: Government Assistance Almanac 1994-95

Program:	**Economic Development - Public Works Impact Program**
Organization:	**Department of Commerce - Economic Development Administration**
Purposes:	To construct or renovate public works and development facilities to provide immediate jobs - i.e., construction jobs - to the unemployed or underemployed. "Public works and development facilities" may include public buildings, historic structures, transportation facilities, water and sewer systems. (Note: this program's funding is included in the total for the Grants for Public Works and Development Facilities Program.)
Eligible applicants/ beneficiaries:	County or city agencies representing recognized redevelopment areas.
Range:	To $600,000

Source: Government Assistance Almanac 1994-95

Program:	**Economic Development - State and Local Economic Development Planning**
Organization:	**Department of Commerce - Economic Development Administration**
Purposes:	For comprehensive economic development planning activities, including salaries and expenses related to the preparation of studies.
Eligible applicants/ beneficiaries:	State governors; chief executives of cities, urban counties, or sub-state planning units.
Range:	$200,00 to $400,000
Average:	$108,000

Source: Government Assistance Almanac 1994-95

MMCIC could also apply under the Public Works and Development Facilities Assistance Program of the EDA. The two specific programs under this umbrella program are the Grants for Public Works and Development Facilities and the Public Works Impact Program.

Applications are accepted on a continuous basis and processed as funds are available. Note, that eligibility for these funds varies. Miamisburg would have to apply through the appropriate eligible entities such as the state or county. For application procedures, the local EDA office should be contacted: Robert F. Hickey, Federal Building, Room 607, 200 North High Street, Columbus, Ohio 43214 ((617) 469-7314).

The National Institute of Science and Technology (NIST) of the Department of Commerce has an Advanced Technology Program which also aids businesses in commercializing technologies. The ATP is a cost-sharing program designed to assist U.S. businesses pursue high-risk enabling technologies with significant commercial/economic potential. The award funding instrument used to fund successful ATP proposals is a "cooperative agreement" which forms a government-industry partnership. NIST plays a substantial role in providing technical assistance and monitoring the technical work and business progress. The following office should be contacted for further information regarding the ATP: National Institute of Standards and Technology, Advanced Technology Program, Administration Building (Bldg. 101), Room A430, Gaithersberg, Maryland 20899-0001 ((800)287-3863).

Program:	**Advanced Technology Program (ATP)**
Organization:	**Department of Commerce - National Institute of Science and Technology**
Purposes:	To assist U.S. businesses in creating and applying competitive generic technology and research results necessary to rapidly commercialize significant new discoveries and technologies, and to refine manufacturing technologies. Project examples: printed wiring board manufacturing technology; flat panel display manufacturing; magneto-resistive random access memories; deep ultraviolet lasers; high temperature superconducting material processes.
Eligible applicants/ beneficiaries:	U.S. businesses, joint research and development ventures, certain foreign owned businesses.

Range:	$500,000 to $19,000,000
Average:	$5,100,000

Source: Government Assistance Almanac 1994-95

Although the funding programs identified above are normally targeted for closing military bases, ERA believes that these funding programs are also appropriate for redevelopment of the Mound, given that activity at the facility was historically defense oriented, and that the closure/downsizing is related to budget cuts in the military spending programs. Assuming that the Mound were to receive average or "typical" awards from the aforementioned Department of Commerce sources, the grant funds might be in the range of $2 million; however, the Mound is not a typical government facility.

In evaluating the usefulness of the alternative funding programs, MMCIC must evaluate its role in the redevelopment process, particularly in light of the fact that the Mound possesses an array of advanced technologies which will remain in place after DOE leaves in 2005. ERA would advocate that the MMCIC assume the responsibility for packaging funding sources, both to cover larger costs associated with site and facilities redevelopment, as well as the specific start-up costs for individual tenants. In the second case, having a MMCIC staff person with personal knowledge of how alternative funding sources could facilitate the start-up of new business activity at the Mound would be a substantial marketing advantage in attracting high-technology firms, and allow the MMCIC to free-up revenue for other needs.

Property Acquisition

The issue of property acquisition for the Mound is governed by three factors. First, a portion of Mound facilities will be tied up in ongoing DOE activities until 2005; Second, a substantial amount of Mound space is contaminated with chemical or radioactive waste, which cannot be cleaned up "over night"; Third, it is estimated that, even after environmental remediation is complete, the Mound will still require incremental investment of about $45 million to create marketability in the property. Since government property cannot be transferred until it has been deemed "environmentally clean" by EPA, MMCIC is faced with a lengthy interim period where it must work with DOE to effect gradual development of clean space as it is released by DOE, consistent with the Mound Ten Year Plan.

During the interim period a caretaker agreement involving DOE, the site contractor, and MMCIC could be structured. The concept of a Caretaker

Agreement was first developed between the local authority at England AFB and the Air Force in which the service and the community leaders developed a program defining the level of maintenance that would be necessary to keep the facility at a marketable level. This was detailed with a specific work program and budget that each group agreed upon. The end result was that the authority assumed maintenance responsibility, and the Air Force paid them for their efforts. This has been replicated at many of the BRAC facilities; the advantage of this contract is that the authority gains the maintenance experience that will be necessary in the long-term and federal resources that can be prioritized according the reuse plan objectives. It is feasible that the MMCIC could serve in this capacity with DOE and the site contractor during the transition period before the federal agencies vacate the Mound entirely, probably by 2005.

DOE and MMCIC are facing many challenges in the cleanup and redevelopment of the Mound. It is premature to present a final conveyance strategy for the property until final agreement with respect to environmental cleanup, scheduling, finding, and site improvements have been established. What is clear is that, until these outstanding issues are resolved, MMCIC should not accept ownership.

Given the complexity of Mound redevelopment, we recommend a process, rather then a consummate strategy. A framework in which the process can occur would include several key points: First, DOE and MMCIC must come to agreement with respect to the components of Mound redevelopment which must occur before transfer can take place. A key component would be establishing consistency between Mound Ten Year Plan block release dates and MMCIC redevelopment phasing. A second point would be that expected redevelopment and clean-up costs, as well as potential sources of funding, would need to be identified. MMCIC would serve in an oversight capacity, to insure that contractor expenditures are consistent with agreed-to goals, while seeking outside funding to support the joint redevelopment effort. This approach would require both DOE and MMCIC to work together during the multi-year effort to achieve the desired result.

Personal Property

There are two categories of property that should be of interest to the MMCIC. The first is high-tech equipment that can be used as a *carrot* in the marketing program for firms that are engaged in research or production that would find the machinery too costly to purchase, but could use it productively while it still has scientific value. In 1993, the Center for Business and Economic Research at the University of Dayton School of Business Administration documented the extent of high-tech equipment at available at the Mound. Seventeen Mound capabilities were placed in three categories according to their commercial potential. Group

One technologies are those with the strongest, most immediate potential for commercialization. Group Two technologies scored somewhat lower on some important criteria. Group Three technologies lacked some key elements for short-term commercialization. The following list outlines the identified technologies.

Group One

- Ceramics
- Flexible Circuits
- Machine Shop
- Non-Destructive Testing
- Destructive Testing
- Surface Analysis

Group Two

- Adhesives
- Surface Modification Processes
- Encapsulation/Foams
- Explosives
- Isotope Separation
- Laser Detonators
- Tritium Processing
- Welding and Joining

Group Three

- Film Deposition, Surface Finishing, and Plating (Surface Modification Processes)
- Lasers
- Metal Hydrides
- Plastics
- Thermites

One category of personal property that would be useful is larger equipment that is used for building and site maintenance. Because the DOE has (and will have) a contract for the maintenance of the site during the current and remediation period, one of two options exists. DOE, in its agreement with its new contractor, could require that the maintenance equipment (snow removal, lawn mowers) be left on site at the end of the contract period. Or secondarily, the contractor could be required to provide the property maintenance activity for the entire site until DOE has vacated, and offer these services at a market rate to MMCIC. If MMCIC effects a caretaker agreement, this equipment would be necessary for maintenance of MMCIC-portions of the property.

In relation to personal property, ERA has found that many of the military closure communities have jumped at the prospect of obtaining office equipment to offer to future tenants. Government equipment is generally moderate quality, and may not be attractive to future Mound businesses, thus having minimal conversion value. If the MMCIC were to agree to keep most of this equipment (desks, chairs, files, lamps, etc.) as part of the acquisition, it is likely to own a great deal of surplus property with no end-user. This will create either storage issues or alternatives disposition problems down the line. We would suggest that most of this material not transfer with the real property. However, we suggest on exception: It is possible that a few larger institutional users may be found for the office space. MMCIC should be marketing this space prior to the time that DOE believes that its final relocation is imminent. If there is a lease or tenant that could use the office equipment, then it should be requested. If the user(s) have not been found by the time DOE leaves, then the office equipment should also go; it would only create problems for construction and retrofit crews when renovation starts.

Marketing Program

Marketing of Miamisburg Mound must be approached in a manner that is not too dissimilar to the *selling* of any business park/ industrial site, with the primary exception that the Mound contains advanced high-tech equipment and scientific know-how which prospective tenants can benefit from. Therefore, the marketing program must identify a target audience which will be most responsive to the marketing efforts. That is, where the dollars spent will generate the most returns and effect strong leasing activity. However, marketing for the Mound will ultimately be a niche approach, in which the criteria for leasing to prospective tenants may be tied as much to the synergy that a new business will create with existing businesses, as with the revenue the lease would generate for MMCIC.

The property will draw largely from the regional market, but may have some prospects that will be from a broader geographic area - specifically tenants that would have a relationship with the core businesses and technology that already exist at the Mound. ERA believes that MMCIC should focus on the following strengths in marketing the property:

- Linkages created by existing businesses, their products, and technologies;
- Equipment that is still available and could be leased at a reasonable rate;
- The potential to combine research activity in labs, and combine this with production capabilities and space;
- Concentration of R&D activity in region, particularly at Wright Patterson AFB;
- The unique redevelopment of the site that is underway;

- The possibility of some continuation of the previous research that was conducted;
- Academic institutions that exist in the region;
- A broad regional industrial base along the I-75 corridor, with strength in auto manufacturing and technology;
- The ongoing DOE presence and the potential for related contracts;
- Competitive rents that are tied to job creation;
- Amenities of the surrounding Miamisburg community;
- The unusual character of the Mound site with its views.

In order to reach targeted business and industry groups, the MMCIC must continue its already-in-place marketing activities, and establish networking links with regional development agencies, such as the Miami Valley Development Coalition. The marketing program should be budgeted in a sliding-scale approach that accounts for the ebb and flow of space availability and leasing turnover. We would envision that, in addition to the marketing staff, funds would be budgeted for the next five years or so, to cover advertising, conference attendance, and the updating of printed materials; the out-of-pocket expensed related to following up on leads would also be covered.

Advertising would be most effective in technical journals, particularly those that are regional in nature and are targeted to fields consistent with the technology areas that were identified in our earlier reports. Likewise, the same approach should be used for conferences (which would include the use of the booth that has already been fabricated) where niche technology companies will be in attendance. We would also recommend the development of *editorial placement*, in which articles are written for local newspapers, technical journals, news magazines and newspapers, and redevelopment newsletters in which the background of the conversion of the facility from energy use to private sector activity is described, and the success of the program is detailed. In this way, publications that must fill space will provide free advertising. This type of marketing could go to a broader audience, at the national or even international level. It may be necessary to use a public relations firm to achieve the most effective placement of these articles.

Because high-quality marketing materials have already been prepared by MMCIC, we believe that much of the near-term marketing activities should be focused on printed materials that are aimed at attracting the attention of targeted firms and answering the questions that their real estate decision-makers would have. This brochure could be sent out, with follow-up, through a mailing to the target SIC code business that have been listed. It should be combined with glossy materials and include:

- Buildings and floor plans that are available;
- Unique features of buildings;
- Space costs;
- Equipment available;
- Energy systems;
- Employee skills developed in the region through previous and current DOE-related R&D activities;
- Local economic characteristics -- taxes, wage rates, employment rates;
- Training programs and financial assistance; and
- Surrounding academic and research institutions.

This material should also contain information on the history of the project, its objectives in the community and the fact that the marketing director will follow up on the package.

Before describing the approach that should be used with prospects, we would like to reinforce our belief that Mound redevelopment will be driven by a combination of business development and business attraction. Business development would be driven by available MMCIC cash flows, grant funds, MMCIC-sponsored training activity, and utilization of high-tech equipment, to foster new business activity from existing and past Mound employees and related defense contractors. Many of the existing Mound businesses are involved in cutting-edge technology, and an ongoing effort must continually be implemented to determine if they need assistance in growth or expansion. Business attraction would occur through more traditional marketing-based avenues, attracting regional or national businesses to the Mound. In dealing with prospects, ERA recommends a marketing process that incorporates the following elements:

1. That a relatively aggressive approach be taken, in which the prospect is contacted and visited as soon as interest is identified to learn more of their needs.
2. A special package of information be prepared and sent out with a follow up phone call; the package could include information covering financial assistance, training programs, high-tech equipment rentals, and related items which could enhance the Mound's marketability to the prospective user.
3. A visit to the site be arranged in which the prospect can tour some of the available spaces, meet with one or two related business owners, and see some of the community, perhaps focusing on neighborhoods and the downtown.
4. Prepare a conceptual proposal for the type of space that would be suitable for the prospect, identify what lease terms the MMCIC would offer, including tenant improvements and estimates for other expenses like utilities. It should be emphasized to the prospective tenant that portions of these costs could be covered by grant funds.

5. Maintain contact until space decisions have been made.
6. When a prospect opts for another location, follow-up for a debriefing to determine what factors led to the ultimate choice, and identify what could have been done differently to have attracted this company to the Mound.

The marketing program has already realized numerous successes, and during the preparation of the plan, prospects have continued to be identified and pursued. However, over time some of the businesses most easily matched to the site, the equipment and the skills that were offered by former DOE employees and related contractors will have been accommodated on the Mound, and the marketing program will have to become more diverse and far reaching. This implies an ongoing retooling and refinement of both the marketing materials, the market area, and the target audience -- particularly as new firm opportunities will be linked (suppliers, contractors, buyers) of the businesses that are already there. To get the greatest mileage out of the marketing budget, we believe that the MMCIC should use the coattails of other, broader programs that are casting their net to secure prospects for the state or the region. The assets and opportunities at the site should be part of the package that other promotion activities can include in their list of locations.

ERA conducted a study of the technology and market potentials that exist for the Mound. These helped guide an initial marketing effort and market testing that our staff conducted. We identified market applications for various Mound technologies and matched these applications with the industries in which the applications would find a use, denoting appropriate SIC codes. For these targets, we analyzed the level of growth these industries could expect in the next five to ten years to help forecast the level of success the Mound could expect in attracting private sector firms to the site as tenants.

With these parameters, we were able to identify the types of industries that could be a good fit with the assets of the Mound and then identify specific companies within each industry group to target for an initial marketing call. To begin in the local metropolitan area, we used the Greater Dayton Industrial PinPointer as our source. This data source is published by the Industrial Map Company and includes the company address and contact, as well as the company SIC Code. These Dayton area companies were then called and asked about their space and equipment needs and whether they would be willing to expand onto the Mound. If the company expressed an interest, marketing materials were sent by MMCIC staff to the appropriate contact. In addition, the company contact was asked if he or she would be willing to meet with Mound representatives to discuss their company's needs.

Companies were also identified in the states of Illinois, Indiana, and Michigan; as it was believed by ERA that these states would have a good sample of industrial and technology firms that might be interested in the Mound's space and technological capacity. Ward's Business Directory was used to identify these out-of-state companies. Ward's only lists the largest firms that fall under each SIC Code. As a result, very few firms identified in other states had less than 100 employees. In addition, Ward's does not list the specific products a company manufactures, so only SIC Code descriptions can be found on these lists.

ERA found that calling these (relatively) smaller companies was usually effective, particularly if the company was small enough that it would be possible to talk directly to the executive running the company. He or she would then be able to discuss the company's space needs.

Findings: A total of 40 Dayton area companies were called and out of those 40, five companies expressed some interest in space or technology at the Mound (a "success" rate of just over 12%). Company contacts that were interested in the Mound were asked if they would be willing to talk with Mound representatives to discuss their needs. Two company contacts said they would. The other companies that expressed an interest wanted more information. They were mailed the Mound Advanced Technology Center marketing piece along with information on who to contact at the Mound for follow-up. This effort by ERA indicates that a moderate marketing effort is able to turn up a number of prospects.

Several companies, which did not express interest in Mound property, facilities, or equipment, indicated a variety of reasons why the Mound did not interest them. Most common was the perceived lack of need for additional space, either because the company did not anticipate growing beyond its current size, or because the company had already made plans to accommodate future growth. Some companies were familiar with the Mound, and were concerned about the facility's former use as a DOE facility for research and assembly of nuclear weapons and related components.

Action Plan

Much of the transition for the reuse of Miamisburg Mound is well underway. As such, the action plan is focused on the continuation of a range of existing programs. Some of the key tasks that should be initiated, continue, or be finalized in the next 3 to 4 years are as follows:

Management Actions

- Finalize and implement the components of the Reuse Plan
- Continue leasing activity
- Monitor DOE environmental cleanup
- Negotiate approaches that will optimize DOE funding and accomplish mutual objectives
- Request prioritization and chronology for remediation activity that fits ongoing MMCIC objectives

Marketing Actions

- Refine the existing marketing plan to utilize Reuse Plan findings
- Develop supplemental marketing materials
- Continue marketing with both mailing and targeted efforts
- Incorporate expanded personal contacts
- Prepare editorial placement pieces
- Follow up on leads & rank prospects
- Attend conferences
- Establish agreements with local brokers for leads, lease signing
- Coordinate with State of Ohio/regional marketing efforts
- Review successes and failures and refine program on an intermittent basis

Development Actions

During the interim period MMCIC should try to implement joint maintenance agreements with DOE and/or the site contractor to facilitate conversion; the maintenance agreement would likely take the form of a caretaker agreement. As environmental cleanup occurs, and as buildings are renovated, MMCIC should establish utility easements, develop engineering/architectural plans for the property, and establish development, planning, and zoning controls for future planning overlays. As DOE vacates facilities under the Mound Ten Year Plan, the process of building renovation and site improvement would begin. MMCIC would need to provide funds for tenant build-out on a case-by-case basis. As properties are renovated, MMCIC would have the option of accepting ownership through conveyance; however, outright acquisition should only be considered when MMCIC has assembled sufficient renovated property and land to create a sense of place in a given area which has stand-alone viability as an independent unit. MMCIC should also begin the process of finding a joint venture partner for development of the land including the South 40 parcel.

Financing Actions

- Initiate contacts with funding sources: state and federal
- Prepare needs assessment for grants
- Develop grant applications
- Revise, as needed, financial forecasts to reflect outside funding.

Implementation of the conversion of the core area of the Mound is likely to continue on its own momentum, assuming that the existing, sound management continues. However, the MMCIC should also look to the future, focusing on the time when the property is clean and other options become available. For example, if the property is to be sold to a private investor after it becomes financially sound, then there may be the need for parcelization of sites (if a multi-owner technology park is planned) or for a more detailed business park master plan for the South 40. With this effort underway, land use controls should be utilized so that building materials, land coverage, set backs, signage, etc. are controlled and the quality of the park is ensured.

Later phases of the action plan will be predicated on the plan evolution and agreements that are currently being resolved, as well as any shifts in the marketplace that created new opportunities. The plan should, thus, be viewed as one with flexibility so that the MMCIC can capitalize on prospects and development opportunities as they occur.

Performance Evaluation Criteria: "Critical Success Factors"

The monitoring and evaluation of the performance of the Reuse Plan for the Mound is an MMCIC activity that preceded the preparation of the Reuse Plan, continued throughout the planning process, and will be ongoing. The "critical success factors" are the measures of accomplishment of the plan. They provide a focused set of factors to be monitored throughout the implementation process. Successful transfer of the Mound to MMCIC will be measured by the extent to which these factors are achieved.

All of the success factors focus on two principal goals: the timely completion of the cleanup and an economically successful transfer of the facility to MMCIC. The ability to lease the facilities for a competitive rate and achieve a low vacancy rate, and to operate the facilities within that rent structure is, of course, the "bottom line" of economic success. This success converts to the jobs that are created and to the related tax revenue to the community.

There are many activities that must be accomplished as part of the transition process during which time DOE and MMCIC will be working together to clean up and convert the facility to one that is economically viable. The critical activities, or "critical success factors", should be systematically monitored and evaluated on at least an annual basis throughout the transition period as well as after transition is completed. These "critical success factors" are the ability of DOE to complete the cleanup by 2005, to accomplish the necessary facility improvements on the same schedule, the matching of the pace that space is available with the absorption of the market, and achieving projected rent levels and related operating costs.

Cleanup Schedule

The Mound Ten Year Plan assumes that DOE will have completed their cleanup and have vacated the site by 2005. While it is assumed that DOE will make every effort to achieve this goal, it should be noted that the DOE 10-Year Plan makes numerous references to the fact that funding of this schedule is not assured. Any delay in the delivery of buildings will negatively affect the financial projections. Each year of delay in completion of the cleanup is another year during which the MMCIC will not be able to become profitable, and during which there must be continuing subsidy of the MMCIC operation. Between 1997 and 2001, the facility is forecast to run deficits ranging between $750 thousand and $1.5 million per year. If the cleanup schedule is delayed, this deficit spending will need to continue. Delay without subsidy for these deficits could result in the financial failure of MMCIC. Additionally, DOE will be required to seek additional funding to complete their mission as defined in their 10-Year Plan.

Facility Improvement Completion

This factor has two dimensions of impact on financial success. The first is that the improvements must be made as part of the process of transferring the buildings and site; the second is that the improvements must be made at the pace at which the market can absorb the space.

The market studies have determined that there is a market for the spaces. That market is willing to pay rents that are at the bottom of the market. The most import factor affecting the viability of reuse is the success in accomplishing the necessary improvements to the buildings and site in order that MMCIC (or their successor organization) can compete in the private market place. The achievable rent levels do not support the capitalization necessary to finance the estimated $45 to $50 million in improvements that are necessary to bring the buildings and site to a level of code compliance, to install decentralized heating and cooling systems, to complete necessary deferred maintenance, and to construct limited improvements to the parking and other landscape improvements such as reforestation and stormwater management that are necessary to accommodate tenants interested is leasing the facilities. Unless these improvements are completed prior to the transfer of Mound properties to MMCIC, there is no financially feasible strategy for reuse of the Mound and for the creation of jobs to replace those lost because of the closing of the facility.

The financial analysis of the Reuse Plan assumes these improvements are made over a 9-year period beginning in 1997 and extending through the estimated DOE departure date of 2005. It is further assumed that the phasing and physical organization of the DOE cleanup contractor's work will complete the necessary cleanup and related building and site improvements in a sequence and physical configuration that is logically organized to permit groups of buildings and the related site improvements to be marketed together. The availability of an individual building out of context with other related abutting or nearby buildings, and without the completion of related roadway, parking, and site improvements, will delay the marketability of that building. Refer to the section on Parcelization and Phasing for a description of these critical relationships.

Additionally, the financial analysis assumes that the building heating and cooling systems are decentralized incrementally beginning in 1998, and completed by 2000, after which time utility costs should be competitive with market rates rather than be derived from DOE operating costs. Delay in the completion of new systems for the buildings to be transferred and leased in the market will increase MMCIC operating costs and delay the point at which MMCIC can take the facilities.

Without the improvements to the building, site and utility systems, the buildings will not be able to be leased over a longer term. Although interim leases are acceptable for buildings that have not been transferred , MMCIC will not be able to accept the transfer the ownership from DOE. This will result in MMCIC's failure to achieve success in their job goals and DOE's failure to achieve success in their transfer goal.

Delays in the completion of improvements and the transfer of a building will increase the number of years over which DOE must carry the buildings as well as increase the number of years over which MMCIC operations must be subsidized. The critical financial relationship for MMCIC is the matching of the market with improved buildings. The sensitivity of the financial analysis to delays in completing the building, site and utility improvements is discussed under Rate of Absorption below.

Rate of Absorption

The financial analysis for the Reuse Plan projects that through 1997, 178,000 gross square feet of space are absorbed. From 1998 through 2001 an additional 350,000 gross square feet can be absorbed (principally industrial and R&D space). Office space, not assumed to be available in quantity until DOE vacates the site in 2005, is projected to be absorbed at a rate of 25,000 square feet per year after that. A total of 200,000 gross square feet of office plus industrial and R&D space is assumed to be absorbed from 2005 through 2010.

In addition to the absorption of existing buildings, the financial analysis assumes that beginning in 2002 MMCIC will be involved in the joint venture development of the open land with new space being available and leased to the market in increments of 5 acres accommodating 65,000 square feet every two years.

The financial projections for the Reuse Plan estimate that the MMCIC can achieve a "break even" financial status at the point at which 500,000 gross square feet or 450,000 net square feet are rented. The projections estimate that, based upon proposed operating expense levels, this will happen by the end of the year 2002.

The fiscal or community impact projections conservatively assume that the space that is leased is occupied at an average "density" of 2 employees per 1000 net square feet. This average combines office use at 4 per 1000 square feet, R&D at 2 per square feet, and industrial and 1.5 per 1000 square feet. The jobs provided by this private sector leasing and development range from 275 in 1997, and 700 in 2000, to 1250 in 2006 (after DOE is gone). These jobs replace the government jobs that drop from 1,200 to 30 over this same time frame.

Any excessive delays in the rate of absorption, either because of the market or the availability of space, will delay the point at which the project becomes profitable, thus requiring more years of subsidy. Additionally, delays will reduce the number of private sector jobs and the related wage and income tax benefits to the community.

Annual financial planning by MMCIC, and the related modifications to the projections that are made to reflect actual experience, will provide an early warning of negative impact and permit necessary planning and action to be taken. The absorption of space that is available but not rented can be accelerated through increased marketing activity (increasing costs) or reduction in rent levels (decreasing income). The alternative to finding a financially feasible adjustment to marketing costs or rents is increased subsidies which will be required if the cleanup is delayed and/or DOE does not make marketable space available in accordance with the Reuse Plan financial projections.

Rent Levels

The financial projections assume rent levels for each use that are near the bottom of the market for similar facilities. Other facilities that are available in the market are better located in terms of access and visibility and do not share the same history, i.e., the potential stigma of radiation contamination. Because the projected rents are at the bottom end of the market, there is a good chance they can be achieved. However, they should be monitored and necessary adjustments made in the annual financial plan to reflect actual rents achieved. If rents drop below the projections, action must be taken to reduce costs and/or identify a source of subsidy to carry the development until such time as it is well enough established in the market to enable it to rent at projected values or above.

Operating Cost

Operating costs include an allocation for administration, marketing, maintenance, professional services and tenant improvement allowances. The current operating costs reflect a transition condition during which it is necessary to focus staff and consultant efforts on planning for the reuse of the Mound, negotiate with DOE to achieve an economically viable reuse plan and market the special use facilities and equipment to a specific market segment. Also during this interim period, MMCIC is leasing facilities to tenants at rates that do not necessarily reflect the market. Using a commonly employed strategy, MMCIC has set lease rates that reflect a desire to attract startup businesses and other tenants who can take advantage of the equipment and begin the process of establishing market momentum for the Mound as a viable private research and industrial park.

During the transition period MMCIC is subsidized by funds from DOE in the amount of $12 million. In addition to a marketing strategy, the current net lease rates often must be lower than the market because of the need to compensate for excessive "pass through" costs of utilities which are established by DOE and are not necessarily reflective of the market. This DOE subsidy is necessary to cover the above market increment of utility costs to tenants as well as cover operating expenses and complete the building improvements that are required to accommodate tenant needs.

After transfer and the departure of DOE from their ownership position, MMCIC must operate the facilities at costs that are market competitive. Over the long term, MMCIC operating costs should not exceed 60 to 65% of gross revenue. This ratio is necessary to be consistent with competing properties in the area. Costs that are in excess of this estimate must be recovered through higher rents or be covered via some form of subsidy. If the Mound were a for-profit business, banks generally would look for operating costs to be no more than 45% of gross revenue in order to provide sufficient coverage for debt service and profits. The recommended ratio for the Mound will permit the accumulation of capital reserves necessary to finance space improvements after the initial improvements are completed and after the transfer of the Mound from DOE to MMCIC.

Although utility costs will not be a direct operating cost to MMCIC after the buildings have decentralized heating and cooling systems, they will be a critical cost to tenants. As noted elsewhere within this section, an underlying assumption for successful reuse of the Mound is that the central power plant is replaced by decentralized systems serving each building or cluster of buildings. In the absence of a decentralized heating and cooling system with market competitive operating costs, it will be necessary for MMCIC to reduce net rents to keep total cost of space competitive. This will, in turn, change the reuse economics and result in the need for long term operating subsidies.

Summary

Five "critical success factors" have been described. Each must be monitored, but of equal importance, the interrelationship of the factors must be monitored. Success or failure in one will certainly impact another. The over-arching imperative is that DOE and MMCIC work together to complete the cleanup as soon as possible and that the code and market improvements be accomplished in parallel with the cleanup. If this is accomplished, the facilities can be marketed at competitive rents and can be operated at competitive costs. It this is not accomplished, the transfer will be delayed, DOE and MMCIC costs will raise, and the success of the Reuse Plan will be jeopardized.

Appendix

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[i] The New York Times, 1996.
[ii] Ibid
[iii] Center for Urban and Public Affairs, Wright State University
[iv] Wall Street Journal, January 31, 1996, P1.
[v] Gentile Station Reuse Plan, March 1995, page 72.
[vi] The Dayton Business News, May 20 1996, page 2.
[vii] Brueggeman and Stone, Real Estate Finance, Richard D. Irwin Publishing, 7th edition, 1981.

Buildings Proposed for Reuse

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Test Fire	3	Explosives Testing	12.4	explosive
Test Fire	49	Timer Fabrication	14.9	explosive
Test Fire	67	Energetic Material Supp	3.8	explosive
Test Fire	80	Magazine	0.3	explosive
Test Fire	81	Magazine	0.3	explosive
Test Fire	82	Magazine	0.3	explosive
Test Fire	83	Magazine	0.3	explosive
Test Fire	84	Magazine	0.3	explosive
Test Fire	85	Power Blend/Process	3.2	explosive
Test Fire	87	Explosives Testing	38.9	explosive
Main Hill	89	Detonator Storage	4.8	explosive
Lower Area "B"	94	Materials Compatibility	1.2	explosive
Main Hill	B	Adv Dev Inert Prod	27.7	explosive
Main Hill	I	High Expl Prod	25.7	explosive
			134.1	**explosive Total**
Lower Area "A"	22	Warehouse	9.1	general industrial
Lower Area "A"	61	Warehouse	45.5	General Industrial
Test Fire	63	Quality/Product Test	16.5	general industrial
Lower Area "A"	73	Gas Cylinder Storage	2.2	General Industrial
Test Fire	104	Test Fire Maintenance	1.8	general industrial
SM-PP	105	Parts Machining	31.9	general industrial
Main Hill	G	Garage	7.5	general industrial
Main Hill	GW	Bonded Stores	9.8	general industrial
Main Hill	M	Machine/Elect Shops	56.0	general industrial
			180.3	**general industrial Tota**
Main Hill	40	Printing Shop	12.2	office
Main Hill	99	Security Ops	11.4	office
SM-PP	100	Security Precinct	6.3	office
Main Hill	A	Administration	55.6	office

Buildings Proposed for Reuse

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Main Hill	OSE	Opns Supp (E)	90.1	office
Main Hill	OSW	Opns Supp (W)	54.3	office
			229.9	office Total
Main Hill	28	Ceramic Production	11.3	R&D
Test Fire	35	Neutron Radiography	2.5	R&D
Main Hill	45	Health Physics	9.6	R&D
Main Hill	46	Welding Dev.	2.4	R&D
Main Hill	48	Surveillance	8.0	R&D
Main Hill	60	Ceramic Production	4.0	R&D
Main Hill	COS	Central Ops Supp	64.7	R&D
Main Hill	DS	Dev. & Stds. Lab	47.8	R&D
			150.3	R&D Total
			694.6	Grand Total

Infrastructure Buildings to be Reused

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Lower Area "B"	24	Potable Water Treatment	0.8	infrastructure
Main Hill	56	Fire Pump	0.6	infrastructure
Lower Area "B"	57	Sanitary Sewer Treatment	0.5	infrastructure
Lower Area "A"	98	Central Fire Station	8.5	infrastructure
Lower Area "B"	110	Fuel Storage Tanks	0.0	infrastructure
Lower Area "B"	112	Sanitary Disposal Sand Filter	0.8	infrastructure
Lower Area "B"	113	Sanitary Disposal Dewatering	0.5	infrastructure
Lower Area "B"	WH1	Well House	0.4	Infrastructure
Lower Area "B"	WH2	Well House	0.4	Infrastructure
Lower Area "B"	WH3	Well House	0.1	Infrastructure
			12.6	

SMPP Buildings

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
SM-PPN	4	Dosimetry	0.67	
SM-PPN	30	Adv Dev & Health Phys	0.7	
SM-PPN	31	Contaminated Waste	8.7	
SM-PPN	33	SM Area Maintenance	1.3	
SM-PPN	36	RTG Support	4.3	
SM-PPN	37	Adhesive Formulation	2.5	
SM-PPN	38	Nuc Opns Prog & D&D	44.3	
SM-PPN	39	Nuclear Opns Support	3.5	Infrastructure
SM-PPN	44	Cafeteria	2.5	infrastructure
SM-PPN	50	RGT Assembly & Test	14.8	
SM-PPN	53	Magazine	0.2	
SM-PPN	88	RTG Admin Supp	7.2	
SM-PPN	90	Retort (Explosive Waste)	0.7	
SM-PPN	95	Utilities Operations-SM	2	
SM-PPN	101	Engrg Supp	1.8	
SM-PPN	102	R.T.G. Program	11	
SM-PPN	EG-2	Electrical Generator	0.24	
SM-PPN	GP44	Clothing Issue	0.4	office
SM-PPN	SM*	Demolished Nuclear Production Building	0	
			106.81	

Buildings to be Removed

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Lower Area "A"	29	Adv Dev Plastics	6.6	
Lower Area "A"	51	Development	3.5	
Lower Area "A"	71	Flammable Liquid Storage	0.8	
Lower Area "B"	19	Salvage and Sales	4.5	
Lower Area "B"	34	Fire Training	1.1	
Lower Area "B"	55	Waste Mgmt	0.3	
Lower Area "B"	72	Hazardous Waste Storage	2.4	
Lower Area "B"	120	Health Physics Storage	0.05	
Main Hill	6	Magazine	0.09	
Main Hill	7	Magazine	0.4	
Main Hill	11	Magazine	0.4	
Main Hill	23	Waste Material Staging	3.4	
Main Hill	25	Weather Station	0.4	
Main Hill	47	Security	3.6	
Main Hill	58	Filter Bank	6.6	
Main Hill	68	D&D Staging Area	2	
Main Hill	79	Waste Mgmt Supp	1.7	
Main Hill	91	Admin/Training	8.1	
Main Hill	92	Prod Training	1.6	
Main Hill	93	Standards Supp	2.9	
Main Hill	96	Armored Vehicle Shelter	0.4	
Main Hill	114	Nitrogen Separation	0.03	
Main Hill	C	Records Storage	13.4	
Main Hill	E	Adv Dev Production	29.8	
Main Hill	E-Annex	Offices	18	
Main Hill	EG-1	Electrical Generator	0.24	
Main Hill	EG-4	Electrical Generator	0.14	
Main Hill	EG-6	Electrical Generator	0.24	
Main Hill	GH	Employment	5.3	

Buildings to be Removed

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Main Hill	GIS	Guard Island	0.2	
Main Hill	GP1	Guard Post #1	7.8	
Main Hill	H	Laundry	17.3	
Main Hill	HH	Isotope Separation	15.3	
Main Hill	P	Power House Main Hill	15.1	
Main Hill	PH	Power House	0.646	Infrastructure
Main Hill	PS	Paint Shop	2.3	
Main Hill	R	Research Lab	55	
Main Hill	SD	Sanitary Treatment (Not in Service)	1.6	
Main Hill	SW	Tritium R&D	43.1	
Main Hill	T	Nuclear Operations	173	
Main Hill	W	Maintenance Shops	32.5	
Main Hill	WD	Radioactive Waste Treatment	16.2	
SM-PP	13	Firing Shed	0.05	
SM-PP	21	Raw Material Storage	4.1	
SM-PP	SST	Salt Storage	0.6	
Test Fire	1	Expl Prod Supp	1	
Test Fire	2	Explosives Testing	6.3	
Test Fire	5	Magazine	0.3	
Test Fire	8	Magazine	0.07	
Test Fire	10	Magazine	0.07	
Test Fire	20	Magazine	0.3	
Test Fire	27	Adv Dev Programs	5.3	
Test Fire	42	High Expl Production	2.9	
Test Fire	43	Thermite Development	1.5	
Test Fire	52	Magazine	0.08	
Test Fire	54	Magazine	0.3	
Test Fire	59	Neutron Radiography	0.7	
Test Fire	64	Magazine	0.07	

Buildings to be Removed

	Building ID	Description	Square Footage (X1,000)	Proposed Reuse
Test Fire	74	Storage	0.4	
Test Fire	EG-7	Electrical Generator	0.08	
			522.156	

MOUND REUSE COMMITTEE COMMUNITY MEETING

Date: Wednesday, July 24, 1996
Time: 7:00 p.m.
Place: Miamisburg Civic Center

Attendance: Cheryl Baxter (Economic Research Associates), Dann Bird (MMCIC), Michael Brooks (Dayton Chamber/SAM-SBDC), Ed Brown (URS Consultants), Valryn Bush (Dayton Daily News), Robert Chaffell, Dick Church, Sharon Cowdrey, Pat Corelli, Ria Davidson (Environmental Technologies & Communications, Inc.), George C. Donahue, Gary Dunbar, Hazel Eisile (City Council), Bret Faulkner (Planning Commission), Allen R. Frederick, Mike Grauwelman (MMCIC), Jim Griffin, Marlin Heist, Rich Higgins (EG&G), David Hirzel (Sasaki Associates, Inc.), Mike Jackman, Keith Johnson (City of Miamisburg), John Maletta (MMCIC), Martha McConnell (Environmental Technologies & Communications, Inc.), Thomas S. Norwalk, Mady Ransded, Aileen Ray, Bob Ray, Steve Sandlin (Miamisburg News), David Santez (MRC), Robert D. Schiffer (MSRC), Sue Smiley (DOE - Ohio Field Office), Joe Stanton, Paul G. Trepany (URS Consultants), Mac Watson, John Weithofer (MRC), Debbie White, Bernice Williams, Russ Williams, Sharon Willis, Charles M. Woods.

CONVENING OF MEETING

The meeting was convened at 7:00 p.m. by John Weithofer, Chairman of the MRC.

ITEM 1 - INTRODUCTION

Mr. Weithofer welcomed the attendees and explained that the MRC is an advisory committee formed to act as a conduit for citizen input regarding the redevelopment of the Mound. The MRC meets on the second Friday of each month at 10 a.m. in the conference room at the Civic Center, the public is invited to attend.

Mr. Weithofer introduced several local individuals:
Richard Church Jr., Mayor of Miamisburg
Mike Grauwelman, President of the MMCIC
Mac Watson, Member of the Planning Commission
Hazel Eisele, City Council Member at Large
Sharon Cowdrey, MESH and MRC
Dave Santez, Associate General Counsel for Mead Corporation, member MRC

This was the second public forum. The goal of the meeting was to obtain public input on the development of the plan. Three options will be discussed. Mr. Weithofer encouraged attendees to take and read the publication created by the consultants.

Dann Bird, Planning Manager for the MMCIC, welcomed attendees on behalf of the MMCIC. He stated that the proceedings were being videotaped, and would be broadcast on cable. MMCIC is the economic development agency for the city, overseeing the exit plan for DoE and the entrance plan of the MMCIC. Mr. Bird reviewed the agenda and encouraged the attendees to share comments and questions. He introduced Dick Galehouse of Sasaki Associates.

ITEM 2: GOALS AND METHODOLOGY

Mr. Galehouse thanked attendees for coming. He expressed his understanding of the significance of the Mound facility to the community. This reuse planning process has been happening in communities all over the country for decades. It is a complex assignment because of the physical and economic challenges. The team is multi-disciplinary, involving planners, architects, economic analysts, and engineers. Mr. Galehouse introduced David Hirzel of Sasaki Associates, Cheryl Baxter of Economic Research Associates, Ed Brown of URS Consultants, and Ria Davidson of *etc.*

Mr. Galehouse reviewed the plan development process. During this meeting, the team will report on the development and review of potential options for the Mound, and obtain comments and reactions. They will use these comments and reactions as input in developing a preferred direction. Based on this direction, they will prepare a draft plan for review, and finally a finished document.

Mr. Galehouse reviewed the site's regional context: proximity to Dayton and highways and the relationship to the Miamisburg community. Many corporations today make location decisions partly based on the community -- Miamisburg is a great community, a great place to live, with good schools and recreational facilities. It is a very desirable community for a business. He explained the site's physical assets in terms of usable areas, areas requiring cleanup, and buildings with reuse potential.

Mr. Galehouse explained that the team reviewed the site from the perspective of a private developer, assessing rent potential, quality of space, etc. Three parties need to come together to develop the plan, and the goals of each will directly affect the form and content of the reuse plan and serve as assessment criteria for selection of the preferred alternative. These groups are the community, DoE, and MMCIC. (*See attached slides for goals of each.)*

ITEM 3: ASSETS AND LIABILITIES

David Hirzel reviewed the assets and liabilities associated with the buildings and the site. The issues impacting the reuse potential of the existing buildings are the condition in relation to potential reuse markets, code compliance, and DoE demolition plans. With the site, the issues addressed include the amount of developable land, road conditions, parking conditions, and general landscape characteristics.

Utilities and infrastructure are also an important factor impacting reuse potential. Mr. Hirzel introduced Ed Brown of URS Consultants to review current thinking about the ability to reuse the basic infrastructure elements:

Water: Site has its own water/wastewater treatment facilities. Highest tower (beige) is approximately same elevation as town's water tower, so will mesh well with the existing system. Proposal to tie the two systems together, will be necsessary to provide moderate upgrade to the water treatment plant to provide city water to the site.

Wastewater: The treatment plant on-site is adequate to support intended uses, may need to be expanded with growth of site. Development of vacant land to the south will connect to the municipal system.

Electric: Provided to site by three feeds with substations that feed buildings. Will be necessary to install individual meters and transformers to site.

Natural gas: Need to provide to site for a decentralized heating and cooling system.

Stormwater: There are many open channels running along narrow roads, roads will have to be upgraded/widened, resulting in stormsewer work. May need larger detention ponds.

Heating/cooling system: Proposing a decentralized system. Current operating cost for the powerhouse is high in relation to the reduced square footage to be serviced.

Mr. Hirzel introduced Cheryl Baxter of Economic Research Associates. Ms. Baxter reviewed the market alternatives. ERA looked at the site as if they were doing an assessment for a private property owner, to determine the best use. Started out with list of potential uses: office/research and development, industrial/light industrial, retail/entertainment, residential, and institutional. The best use, considering the market and what's there already, is to continue to use the site in a way similar to how the Department of Energy has been using it: a business park. An economic assessment of the office/industrial market in the Dayton area was conducted.

Three scenarios were developed:
1. Industrial park
2. Industrial and technology center
3. Technology center (more research and development)

ITEM 4: OPTIONS FOR REUSE

Mr. Hirzel gave an overview of the site and reviewed the options for reuse.

1. Industrial Park: This option requires the least investment to produce potentially viable economic development. This transfers the property to the highest bidder(s), and would get the MMCIC out of the process as early as possible. The only improvements made would be those necessary to achieve compliance and make the site accessible and occupiable.

2. Industrial and Technological Center: This seeks a higher value market. The development strategy for this is for the MMCIC or its successor public/private operator to manage the property so as to ensure that work is done, quality is created, and markets are taken advantage of. The investments in this are somewhat more, so a higher value place is potentially created.

3. Technology Center: This would be a competitor to the Miami Valley Research Park. This aims for even higher value, seeks to be investment-grade piece of real estate. The investment is necessarily considerably higher. This also breaks the open land in the south into small parcels, where the other options sell the area in bulk.

Ms. Baxter made comparisons between the three scenarios, based on the goals outlined for each of the three groups: the community, DoE, and MMCIC. *See the attached slides for details of the comparisons.*

Mr. Hirzel explained that options one and two were found to be financially feasible, but option three is not. The relative advantages and disadvantages of one and two are impacted by:

1. The availability of space for the market - success is time sensitive, so we need to work hard in the next steps to ensure that the transition can be accomplished in a timely way
2. The extent to which the facility at the point of transfer is reusable in the private marketplace. MMCIC must work with DoE to ensure that the utility systems, buildings, site are all economically usable.

The more buildings that are torn down (within limits), the more money can be potentially saved in the cleanup process. Therefore we think option two is preferable to option one. Also more money is being spent on making it a higher-quality place, and the overall value of the land abutting this place and community as a whole is affected by success in creating an attractive, high-quality use.

Option two is financially attractive to the community because it produces the highest tax return to in terms of wage taxes. Also, the strategy it proposes ensures continued involvement of some public/private body, maintaining public control of the process.

The recommendation is that option two be selected. The selection process involves the reviews we've been having today, the meeting tonight, and the meeting tomorrow with the MMCIC Board. The process after selection of a preferred plan is to finalize this plan, coordinating with DoE and their closure strategy, to refine the implementation strategy, and to come back in October with a plan option that will be recommended to the board for approval and implementation.

ITEM 5: QUESTIONS AND COMMENTS

Q: I work at the Mound - we hear about budget cuts all the time. Looks to me like the plans won't go because of the budget cuts. How will the budget cuts affect the plans?

A: Your observation is on target - the budget clearly affects what we're trying to do here at the Mound. There is an extreme sensitivity to time schedules and release schedules for when MMCIC can make these facilities available to the private sector. We are having discussions with DoE about ownership - clearly that would be affected by budget cuts. One reason we feel strongly about being involved in that process is that we believe that through implementation of this plan there may be some cost savings that could be identified, help DoE meet their schedule of leaving by 2005. Whether that is achievable or not is yet to be seen, whether our budget will go unscathed in this budget-cutting climate that we have in Washington. Clearly that is our number one concern. Fortunately, the region is unified in its support of this activity - one of the things we have going for us over other sites in the complex is that it is one of the easier sites for them to get out of, to show a victory, show success within the complex. In fact some of the other sites, have a type of contamination that is hard to describe. They're not even sure what they have. So the big thing we have going for us here is that we have positive activity going on. Through economic development we will have over 300 new private sector jobs on-site by the end of this year, precluding any other businesses coming onto the site. That's a positive environment, and politically that could gain support of our Congressional delegation, and DoE could potentially cut some of their landlord costs here. That's why we're trying to get momentum going and keep it going here. If we can't do that, it's very possible that the budget cuts will continue to come. But if we keep the positive events occurring here, if we give DoE the opportunity to get out and cut their losses here, as many corporations would do in a site like this, we might even get increased funding because the shorter the time over which DoE is here, the more money they'll save in the long term. DoE wants to clean up and get out.

Comment: I agree with their selection, that option two is the best for Mound.

Q: What is meant, under the evaluation of option one on the slide, by "DoE rapid exit goal is threatened"?

A: We meant that the higher the feasibility and probability of success, the higher the feasibility and probability of DoE's rapid exit. So the comment is related to it having less of an economic viability and a longer-term period over which success could be realized. We are seeking common goals and common outcomes - in our view, their success is aided by our success. DoE's goals are threatened in that this is a less attractive option. There is a subtle difference between one and two you may have missed - in one, there is a single buyer or multiple buyers, but there is no continuing involvement of a non-profit organization such as MMCIC. Our instinct and our experience with this type of property, is that you may need an

ongoing organization such as the MMCIC or its equivalent that has community interest in mind, has jobs in mind, and is in a position to receive federal and state grants as a non-profit for certain kinds of job development or job training. So the assessment is that there is less probability of success with option one than with option two.

Q: Have you looked at external costs such as access, drainage, etc. in the financial analysis of the alternatives, and were they different?

A: The off-site costs that are in the options include any investment that is required in upgrading the amount of water, or connections into the sewer plant at the south end of the site. Roadway improvements are part of the general community investment strategy and were roughly equal for all three. Those are costs that don't differentiate one alternative from another. So the answer is that for those that are different, those are in there. Those that are not different for the options, or that are part of the larger civic improvement strategy, they are not in there.

Q: The remediation of the site - will involve staging, and accumulation - from a release perspective, what will be the availability of the site for the intended use - did you consider that? You were talking about the whole site, but are you going to have to wait five years for this piece, seven years for that piece - is that also one of the considerations?

A: DoE will release the property in pieces. For example the south 40 is the first piece that could be available for a full release. The current activity, all the new jobs, are going into the space on a lease basis. The financial analysis does directly consider the relationship between the release of the land and the absorption. One of the caveats, as Cheryl was pointing out, is that if for any reason DoE's ability to release the property is slowed down, this would dramatically affect the financial analysis that she has carried out. We may need in our assessment to separate a little bit the transition period until 2005 from a model of 2005 in terms of understanding the financial impacts.

Q: If it's going to be a lease scenario in a phaseout, a question from the infrastructure perspective, it sounds like there's a lot of transition of infrastructure design early on, and costs associated with the upgrade and improvement of that, would then slow portions of the property available for development, really a high carrying cost until the balance of it can be released. Is that a correct view?

A: That is correct - there is a high carrying cost, primarily around water, sewer, power, heating and cooling. There is a major issue with the centralized system versus the decentralized system and the high carrying costs of that operation until 2005. There's a fixed amount of cost there with the centralized system, and that is a point of discussion between the MMCIC and DoE - how can the two parties reduce that fixed overhead and carrying costs. That discussion has been happening over the last several days and will continue.

Q: Where are you in your financial analysis? Is it published yet?

A: Cheryl has done a 125 page analysis, including 25 of these complicated-looking tables which effectively look at the financial results of the functions you've seen. We're not anxious to release them because these are done under multiple sets of assumptions, very much directed to the three physical alternatives you see here. Over the last two days as we discussed the alternatives, we can see other options, and combinations of options. For example, even though we think that two is the strategic direction to pursue, we indeed may choose to remove more buildings, more like option three. And we don't have that financial analysis with us. So we're not anxious to release it. So all of that is information that is informing us in how to move to take the next steps.

Q: When will you publish it? When will you put it out so people can look at it?
A: I think that clearly when we come back with the preliminary draft plan we must show you all of the analysis, and that will be legitimate. It would be misinformation for you to see 25 different financial performances at this time.

Q: So the goal of tonight's discussion is to choose one of your options?
A: Yes, we are recommending that we basically pursue what you see in number two and I think you have quite a bit of the backup material in the handout. Refinement and negotiation and discussion around that direction.

Q: So the next phase is how to finance the chosen option?
A: Yes.

Q: All three options involve new construction, particularly on the south property; is that driven by your earlier statement that it will be one of the first parcels available for lease? There's a significant price tag to upgrading existing structures to bring them up to code - there's also a price tag to build new structures - I guess what's driving the new construction?
A: What you're seeing is a snapshot of a fully developed site under a set of assumptions. That picture, let's say scenario two was real, you might not see that until 2010, 2020, a long time in the future. The fact is that the south 40 under that scenario may be later phases of development. In fact, we concentrate on existing buildings that can be easily reused and in fact if you look at the buildings that are being released for these 300 new jobs, most of the buildings that have special equipment are in good shape and fit right into it. That's part of the strategy to keep costs down.

Q: In your plan, option two obviously is the one that you're leaning toward. Can you explain the impact of building, in terms of zoning?
A: We have not looked at the specifics of that relationship - we know that that's a simpatico kind of relationship, someone may be doing some research related to manufacturing that is also being done on the site. In fact, that was one of the pluses of the site. From a community perspective we're going to probably need a special zoning district, some special multiple use zoning district that will allow mixed use on the property and perhaps some retail support uses consistent with contemporary multiple-use business and technology parks. But we would be looking at that.

Comment by David Hirzel: The word industrial in this case refers to research and development, not to smokestack industrial. One of the reasons for moving up from number one to number two is to seek the kind of light assembly of technology that's being researched elsewhere on the site, that's the goal for the investor we're talking about, the clean, high-tech, smaller scale industrial. In that context, there's a lot of synergy and in fact the new buildings as they're developed would have the ability to be occupied for offices in which R&D might be done and assembly would be out back.

Q: Once the cost estimates are in place, what are the expected sources of funding?
A: As you know, there was a grant made available to the community which the MMCIC utilizes for its ongoing operations and capital improvements. That's going to run out in a few years. So there is a major issue as to the source of funds. Part of this process and part of the discussions with DoE is to explore sources of funds. Again, there is no answer to that. The discussions, for example, that we're having with DoE center around finding ways to reduce their costs. Is there a way that some of those cost savings can be utilized to bring buildings to code compliance, or to make the site more feasible for private reuse, which is also one of the DoE's goals? There is no white knight that we can see at this time, and there is the threat that

we will run out of funding in a few years. This privatization effort already is producing lease revenue - we are driving toward a model in the plan where revenue from the facilities on the site or the sale of this land will create a self-supporting self-sustaining operation. The issue is how do you get there? We don't know exactly how many hundreds of thousands of square feet we have to lease yet, but we know that we're a long way from being there.

Q: Under option two - can you explain how the DoE's cleanup costs could be reduced?
A: As you may know, DoE has a detailed cleanup plan which has been costed. It is called the Integrated Comprehensive Plan (ICP). It includes their costs for cleanup, their carrying costs to 2005, it's all elaborately costed and laid out. How can we help DoE save money? That plan, for example, assumes that they will remove about 200,000 square feet of existing space. You will notice that all of our options propose removing twice or three times that. So instead of DoE having to bring a building up to code compliance or perhaps remove hazardous material, we simply remove the building, demolish it. We can identify multi-million dollars worth of savings just in that effort. There may or may not be other ways we can save money. If their cleanup plan and this reuse plan become one and the same, very significant cost savings can be achieved. This reduces their time frame as well as actual dollars.

Q: What role is the City of Miamisburg going to play in monitoring the cleanup?
A: The city will be very active in monitoring the cleanup. The approach we take is very simple - we work closely with the OEPA - there will be some technical expertise available both through the city and the MMCIC staff - we will utilize them in the process. We intend to be a very active partner in the process to understand timeline, schedule, standards, and funding issues. We will provide input from the city and the community through the various mechanisms. It is critical, since the Mound does sit at the heart of the city, that we are very active and interested in the process.

Q: Is DoE going to allow that?
A: DoE is very committed to seeking city and community input, through MRC and the process. I've seen a very strong, sincere effort on the part of DoE, and I take the department at their word.

Q: Does anyone know when the tape will air?
A: I'm not sure of the schedule. Call the City Manager at 847-6456 to find out. There is also an ad in the Miamisburg News each week, so you could check that.

Q: Mr. Brown talked about the water tower and its connection with the city's water tower; you lost me there. Can you explain that again?
A: There are two water storage tanks on the site. One tank is close to the elevation of our medium service tank in the city system. Right now the city's medium pressure district comes right up to Mound Avenue. The opposite end of it is out by the Ford dealership where the water tower is. As the water comes over to this end of the district, pressure is lost due to line losses. Tying in the towers will allow the city to take care of some of their low pressure problems at this end of the district. It will also provide a source of potable water for the Mound. Right now the water is treated adequately on-site at the Mound, however a change in the use of the site will likely lead to a change in water treatment standards. The city is already set up to meet those standards through their present water treatment plant. So all we would do is expand that plant to a level commensurate with the amount of water we need, approximately 150,000 gallons per day.

Q: So the water from the site would be transferred to the city's water treatment plant?
A: The wells that are currently on site at the Mound site would not be used to provide water to the city. The city wells have an adequate water supply, they don't want to co-mingle those.

Comment: I agree with option two.

Q: If you sold the south 40 outright, how much would you expect to net?
A: In one scenario, the south property would just be sold off in bulk, in another the new owner would share in the development with the MMCIC, and in the last the owner would just develop it outright. We're figuring that right now that acreage with streets and with infrastructure to it would sell for about $25,000 an acre. We haven't figured out what a net would be, but that's about what that value is. Obviously, if you develop it, put some spec space on it, then the value increases and there's more potential to get out of it. The $25,000 is per developable acre, not for the whole piece.
Q: Times 40 would be what, a million bucks?
A: Don't forget that's serviced land, someone has to pay the cost of water, sewer, and streets.
Q: If you need to raise money, why not sell it off lock stock and barrel?
A: You're looking for a rural land value? Well, it's a farmland value given its current access, very low value. Not good for cash generation. You don't want to sell that land early in the process. Its value is in the later phases.

ADJOURNMENT

Mr. Weithofer thanked the attendees for coming, invited them to attend additional public forums. Meetings will be announced publicly and notices sent.

MOUND REUSE COMMITTEE COMMUNITY MEETING

Date: Wednesday, December 11, 1996
Time: 7:30 p.m.
Place: Miamisburg Civic Center

Attendance: Stan Abrahamson, Dann Bird (MMCIC), Thomas L. Chapman, Jack Clark, George C. Dunahue, Richard Galehouse (Sasaki Associates), David Hirzel (Sasaki Associates), Nancy Johnson, Richard Loving, John Maletta, Martha McConnell (Environmental Technologies & Communications), Christine Neitzke (Environmental Technologies & Communications), Brian Nickel (Ohio EPA), Robert D. Schiffer, Alan C. Schwab, Sue Smiley, Bob Stanley, Ellen Sweet, Howard Sweet, Paul G. Trepany, Deb Turner, Cidney B. Voth, Jolene Walker.

CONVENING OF MEETING

The meeting was convened at 7:30 p.m. by Dann Bird, Planning Manager for the MMCIC.

ITEM 1 - INTRODUCTION

Mr. Bird welcomed the attendees and explained that the MRC is an advisory committee formed to act as a conduit for citizen input regarding the redevelopment of the Mound. The MRC welcomes questions and comments regarding the project. This is the third in a series of public meetings designed to inform and obtain input from the community.

Mr. Bird introduced MMCIC and MRC members:
Brian Nickel, MRC
John Maletta, MMCIC
Mike Grauwelman, President of the MMCIC

Mr. Bird stated that the proceedings were being videotaped, and were being broadcast on cable. The meeting would consist of a review of the plan, followed by time for questions. The plan is the result of over nine months of work. It will guide development of the Miamisburg Mound site.

He explained that the consultants would be presenting a draft plan for the research/industrial development proposal. The MRC will make a recommendation to the MMCIC, who will present the plan to City Council.

Mr. Bird introduced David Hirzel of Sasaki Associates.

ITEM 2: INTRODUCTION TO THE REUSE STRATEGY FOR THE MOUND

Mr. Hirzel thanked attendees for coming, and recognized his team of consultants. The reuse strategy for the Mound looks toward a ten-year process of clean-up and development. The plan is a framework in which negotiation can take place, and should result in successful reuse of the site.

Mr. Hirzel gave an overview of the presentation to be made. This meeting will review the goals, methodology, assets and liabilities, options, proposed reuse plan, and next steps.

The planning process has passed through feasibility analysis, option development, reuse plan preparation, and are now at the documentation phase.

As discussed at the last community meeting, each stakeholder group has both shared and individual goals. Shared goals are an environmentally clean site, and the successful transition of the Mound to a private research and industrial park.

Individual goals include the community's focus on job creation, economic benefit to the community, and making sure that the site is a good neighbor. The MMCIC's focus is on developing a financially viable site, and the DOE wants to clean up the site at minimal cost and move on.

QUESTION from citizen: I thought we had the place cleaned up - why do you have to do more clean-up?

RESPONSE: This is a longer process; completion of the clean-up is planned for 2005. There are a variety of clean-up projects underway, including the radioactive clean-up that you are referring to.

QUESTION: After operations cease, what do you do?

RESPONSE: Our ten-year program aims to clean the site and improve the buildings for reuse. There will be interim leases during this period of time.

QUESTION: There are 16 or 19 groups of people who want to get in to the site - when can they get in?

RESPONSE: There are now 21 businesses located on the site, leasing space. Right now we are trying to lease the property, as DOE cleans it to a level where the MMCIC can take ownership.

QUESTION: Will you let it out piecemeal?

RESPONSE: Right now, we are leasing property. Before taking ownership, the City needs the site to be cleaned and improved to a level that supports industrial reuse.

The Mound has a lengthy and distinguished history; it has been an important contributor to our national defense. The future of the site is promising and will be achieved by addressing building conditions, parking and access, and operating costs.

The vision of the site has several key characteristics.

Some Mound buildings will be retained and reused. Of the about 130 buildings on the site, 33 are reusable for economically viable purposes (about 700,000 square feet). The SMPP area is not part of the reuse plan. This area contains about 19 building which are not included in the preceding numbers. Additionally, there are ten buildings housing utility systems such as the sewage plant that are not included in the 33 buildings.

The open space system proposed under the reuse plan takes positive advantage of areas that are economically undevelopable due to steepness. The open space system helps manage erosion, provide recreational opportunities, and gives the development a distinctive character.

The spine road provides access from Mound Ave. to the various parts of the site. It is included in the plan because once the gate is opened, the buildings will require access. In the long-term, the spine road will be extended further south to Benner Road.

The plan includes sites for about 800,000 square feet of potential new structures. However, the plan begins by rehabilitating existing structures. Success at marketing the existing properties will create development opportunities for new buildings.

ITEM 3: METHODOLOGY

Because the ultimate success of the Mound will be determined in the private market place, the plan was created from the perspective of a private developer. It was necessary to understand the market for space in the area, the buildings and their ability to accommodate the intended uses, the site, the infrastructure, and the related operating costs for the Mound.

The decision-making process included public meetings, DOE and MMCIC work sessions, land use committee negotiations, and MMCIC and MRC work sessions.

ITEM 4: ASSETS AND LIABILITIES

The planning process has determined the capability of the site to support development (understanding factors such as steepness of certain areas.) The land use possibilities for the site were determined for the various areas: Main Hill, SMPP, Test Fire, Lower area "A", and the south parcel. The total land area of the site is 306 acres, and of that 155 acres are developable.

Important assumptions were made about building reuse and demolition. There is about 1.3 million square feet of space currently on the site. About 700,000 square feet of that is potentially reusable. To be used, the buildings must be improved to meet codes and market condition.

Circulation and parking capabilities were important considerations. In the past, the site had a gate, and employees parked where space was available and walked to their place of work. Now, it is necessary to upgrade the roads and parking to private standards. The roads on the site are below standard, and parking is not well located.

The infrastructure (water, sewer, electric, storm water, heating, and cooling systems,) is also an important facet of the site. Water, sewer, gas, and electricity will be provided by the local utility. Heating and cooling systems will be decentralized.

We took a detailed, careful look at the market; the site must be economically viable for the reuse to be successful. We looked at the office, research and development, and industrial markets. We studied the annual market absorption for these three markets.

ITEM 5: REUSE OPTIONS

At the last community meeting, three options were discussed. Two new options were seriously considered between then and now.

One option was total clearance of the site. This changed the afteruse to residential or open space, which significantly raises the cleanup costs and essentially eliminates jobs.

Another option was purchase by a single tenant. Under this option, one person or group would buy the entire site. Although this would save some money, according to a national survey

The facilities have marvelous potential, but a lot of work remains to be done. We are encouraged as to the potential of the site and look forward to coming back in 10 or 20 years and seeing the vision in place.

Mr. Hirzel thanked people for coming, and invited questions from the crowd.

ITEM 6: QUESTIONS

Q: It appears that the cost per square foot is too high - no one but big companies can get in. Also, you'll have to privatize the heating systems, or they won't work. You can't heat the whole place with the power plant you have. The water systems will cause problems, you'll have to have big pumps to get the water up that high. You're only using half of the area - why? Is there something wrong with the rest?

A: In reference to the usage question, there are steep slopes which are hard to build on. In terms of existing buildings, there is about 700,000 square feet of reusable space. The site is very dense right now; the newer development will be less impervious. The goal as far as rental rates is to look at competitors and others in the area. Some investment in the site is necessary for success.

Q: Where is the money going to come from? The federal government?

A: The issue is that the investment of additional money to make the site economically viable in this market is necessary. If the investment is not made, the community should not take the facility. So the conversion must assume that money is found to make the site economically viable. The money can come from a variety of sources around the country, from federal, state, possibly local funding. The opportunities there are worth pursuing to close the gap.

Q: What are the contingencies if the plan takes longer than 10 years?

A: In our experience, 20 years is average, believable for these complicated conversions. This one is particularly complicated because we are cohabitating with DOE for the first ten years. We don't know exactly how schedule changes or delays would affect the plan, but we have subdivided the site in such a away that the areas of complicated cleanup are independent of development opportunities.

Q: Can industries wait for the cleanup to happen?

A: They are already there, cohabitating with DOE. Companies can lease space while the closure process is going on. 21 businesses are currently operating at the site through lease arrangements.

Q: How is the clean-up schedule being integrated? How long can it go before the plan unravels?

A: The simple answer is that we don't know yet because the baseline marker is a 2005 departure. We haven't completed a sensitivity plan, but we expect it could take longer. That's why we've been very conservative in cost, rate, and absorption projections. We have to work together to determine the contingencies. We will need a contingency if the funding gets stretched out. The plan is set up so that the biggest potential problems are the last - the plan is not dependent on early action in those areas.

Q: Why is nothing planned for the south area soon?

A: We want to make the most out of the land. The current market is not good, but in ten years when the site is successful the land will be part of a successful place and therefore worth more. We are not projecting any land sales there for the next five to seven years.

Q: What about the water system? How will that work? What about site drainage?

A: We will tap into Miamisburg's existing water system. We estimate the demand to be 150,000 gallons per day. Improvements are needed for onsite drainage management. There will be no increase in offsite drainage.

Q: Has the analysis of the spine road been stretched out to include the impact on the surrounding community roads?

A: We have looked at the capacity of those roads and there are plans for eventual improvement to them. We think that by opening additional entrances we will prevent pressure from building up on one main entrance. Also, the projected population traveling in and out of the site is not expected to be a nuisance to abutters.

Mr. Bird thanked people for coming and invited them to call him with any further questions or comments.

Mound Advanced Technology Center

A Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community
Improvement Corporation

with
Sasaki Associates, Inc.

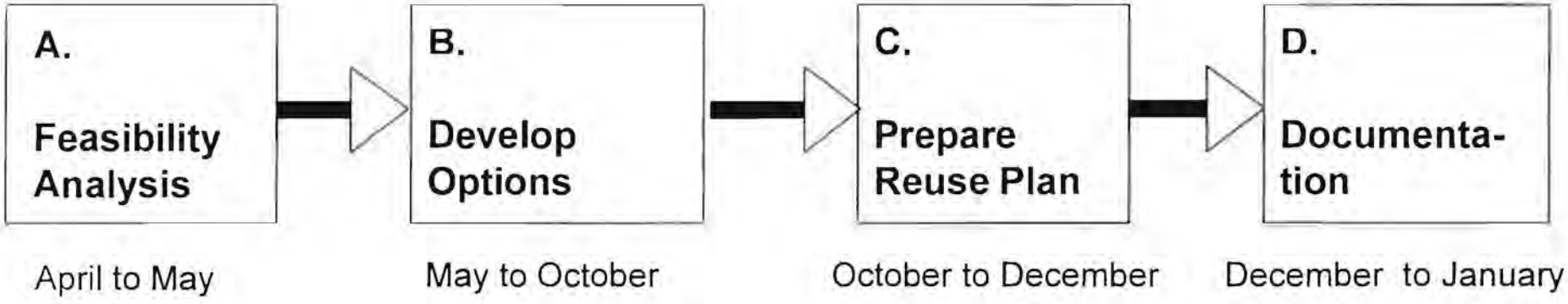
URS Consultants, Inc.
Economics Research Associates, Inc.
Hamilton Rabinovitz & Alschuler
Environmental Technologies, Inc.

Today's Presentation

Recommended Reuse Plan Presentation

- Goals
- Methodology
- Assets and Liabilities
- Options
- Proposed Reuse Plan
- Next Steps

The Planning Process



Goals

Shared

- Environmentally Clean Site
- Successful Transition of the Mound to a Private Research and Industrial Park

Goals
Individual

Community

- Jobs, Salaries and Salary Tax Contribution
- An Economic and Technological Asset for the Region
- Positive Visual and Physical Asset "A Good Neighbor

MMCIC

- Jobs and Economic Development
- Mitigate the Economic Impact of Closure Upon Employees and Community
- Financially Viable Plan
- Achieve Revenues Sufficient to Complete Transition

DOE

- Eliminate DOE's Landlord Responsibilities
- Minimize Clean Up Costs to Taxpayers
- Complete Clean Up and Transition by 2005

The Place

- A Distinguished History
- A Promising Future
  - Building Condition
  - Access and Parking
  - Operating Costs

The Vision

- Contemporary Research and Industrial Park
- Buildings Improved to a Marketable Condition
- Site and Infrastructure Improved to Support Buildings and their Tenants
- Sites for Future Development

Methodology

A View from the Perspective of
Private Development

Methodology

Determination of Assets and Liabilities

- Market
- Buildings
- Site
- Infrastructure

Decision Making

- Public Meetings
- DOE & MMCIC Work Sessions
- Land Use Committee Negotiations
- MMCIC & MRC Work Sessions

Assets and Liabilities

Land Use

- Main Hill
- SMPP
- Test Fire
- Lower Area "A"
- South Parcel

Assets and Liabilities

Land Use

- Total Land Area - 306 Acres
- Developable Area - 155 Acres

Assets and Liabilities

Building Use

Issues:

- Existing Square Footage - 1,300,000
- Reusable Square Footage - 600,000 to 800,000

Assumptions for the Plan:

- Buildings are improved to a code compliant/marketable condition

Assets and Liabilities

Circulation and Parking

Issues:

- Roads Below Standard
- Parking Poorly Located

Assumptions for the Plan:

- Upgrade Roads to Local Standards
- Relocate Parking to Serve Buildings

Assets and Liabilities

Infrastructure

- Water
- Sewer
- Electric
- Storm Water
- Heating
- Cooling

Assumptions for the Plan:

- Water, Sewer, Gas and Electricity are Provided by Local Utility
- Heating and Cooling are Decentralized

Assets and Liabilities

Market Potential

- Office
- Research and Development
- Industrial

Assumptions for the Plan:

- An Economically Viable Development

Assets and Liabilities

Market Potential

Annual Market Absorption

• Office	25,000 Net S.F.
• Research and Development	25,000 Net S.F.
• Industrial	50,000 Net S.F.

Options for Reuse

Total Clearance of Site

- Remove All Buildings and Infrastructure
- Revise Future Use to Open Space and/or Residential

Cost - an additional $750 to $1,200 Million

Findings - Job loss and substantially more costly

Options for Reuse

Purchase by a Single User

- Revise Market Strategy to Seek a Single Tenant or Buyer

Cost - Savings Potential of 15 percent

Findings - Probability of Occurring is 5 percent

Options for Reuse

Mixed Use Research and Industrial Park

Building Use

• Office	229,900 S.F.
• General Industry	180,300 S.F.
• Research and Development	150,300 S.F.
• Explosives	134,100 S.F.

Cost - Requires a $50 Million Investment in Improvements

Findings - Success Requires Improvements to be Completed Prior to Transfer.

Proposed Reuse Plan

A Strategy for Joint MMCIC and DOE Plan for Clean Up, Improvement, and Economically Viable Reuse

Proposed Reuse Plan

The Market

Responding to a Regional Market for Low Rent Research, Industrial and Office Space

Proposed Reuse Plan

The Market

Projected Annual Absorption

• Research and Development	25,000 Net S.F.
• Industrial	50,000 Net S.F.
• Office	25,000 Net S.F.

Proposed Reuse Plan

Land Use

Parcels	Name	Use	Building Reuse Area	Potential New Bldg. Area
A	Building 61	General Industrial	47,700 s.f.	-0-
B	Lower Parking Area	Research and Dev.	-0-	200,000 s.f.
C	Main Hill (*front*)	Office, R&D, Gen. Industry	436,700 s.f.	100,000 s.f.
D	Lower Area "A"	R&D, General Industrial	9,100 s.f.	40,000 s.f.
E	Test Fire	Explosives	96,700 s.f.	-0-
F	Bldgs 100 and 105	Office & Gen. Industrial	31,900 s.f.	60,000 s.f.
G	Overlook	General Industrial	6.300 s.f.	150,000 s.f.
H	Lower Area "B"	Infrastructure	12,600 s.f.	-0-
I	Main Hill (*back*)	Explosives	66,200 s.f.	-0-
J	"South 40"	General Industrial	-0-	290,000 s.f.
TOTAL			**707,200 s.f.**	**840,000 s.f.**

Proposed Reuse Plan

Land Use

Use	Number of Buildings	Square Feet
Office	6	229,000
Research and Development	8	150,300
Industrial	9	180,300
Explosives	14	134,100
Infrastructure	10	12,600
Total		**707,200**
Additional Development Potential		**840,000 S.F.**

Proposed Reuse Plan

Circulation and Parking

A Spine Road Accessing All Parcels

Roads which Meet Community Design Standards

Parking in Proximity to Buildings

Proposed Reuse Plan

Open Space

Permanent Protection of Open Space

Reforestation of Steep Hillsides

Campus Landscape Environment

Proposed Reuse Plan

Infrastructure

Public Water and Sewer

Storm Drainage

Gas and Electric Service to Buildings

Decentralized Heating and Cooling

Next Steps

- An Ongoing Long Term Process
- A Joint MMCIC/DOE Plan
- Closing the Financial "Gap"

Next Steps

- Monitor Critical Success Factors

- Clean Up Schedule
- Facility Improvement Completion
- Rate of Absorption
- Rent Levels
- Operating Cost

Next Steps

- Confirm Public Support
- MMCIC and MRC Review and Approval
- Final Plan Documentation
- Ongoing MMCIC Work with DOE to Achieve Joint ICP/Reuse Plan

Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community Improvement Corporation

with

Sasaki Associates, Inc.

URS Consultants, Inc
Economics Research Associates, Inc
Hamilton Rabinovits & Alschuler
Environmental Technologies, Inc.

Today's Presentation

Due Diligence

- Site Opportunities and Constraints
- Building Reuse Potential
- Development Potential
- Market for Reuse

The Site

- Main Hill
- SM-PP Area
- Test Fire
- Lower Area
- South Parcel

Physical Assets

1. Regional Context
2. Transportation
3. Natural Resources
4. Slopes
5. Soils
6. Areas of Clean-Up
7. Developable Land
8. Reusable Buildings
9. Utilities and Infrastructure

Physical Assets

1. Regional Context

- Proximity to Dayton
- Proximity to Highways
- Miamisburg Community

Physical Assets

2. Transportation

- Mound Chosen for Isolation
- Improved Access Required
- Potential Connections
  - Benner Road
  - SR 892
  - Mound Avenue
  - Cincinnati Pike

Physical Assets

5. Soils

- Soils Constraining New Development (**79%** of the site)
- Correlates with Steep Slopes
- Construction Premium Costs

Physical Assets

6. Areas of Clean-Up

- Areas of Clean-Up
- Close Coordination of Clean-Up Required

Physical Assets

8. Existing Building Inventory

- **1,346,000** Gross Square Feet

Physical Assets

8. Existing Building Inventory

- Office / Administration Space **281,900** gsf
- Lab / R&D / Production Space **898,800** gsf
- Support / Service / Storage **165,800** gsf
- Total Area **1,346,500** gsf

Physical Assets

8. Building Reuse Potential

- Office / Administration Space **252,000** gsf
- Lab / R&D / Production Space **517,000** gsf
- Support / Service / Storage **87,000** gsf
- Total Area **856,000** gsf

Physical Assets

8. Buildings to be Removed

- Gross Square Footage of Buildings with No Reuse Potential **490,000 gsf**

(this includes the 173,000 gsf T Building)

Physical Assets

8. DOE Building Removal Plans

- Gross Square Footage of Buildings with No Reuse Potential **490,000**gsf
- Gross Square Footage of Buildings to be Removed by the DOE **282,200** gsf
- Balance to be Determined **207,800** gsf
  (including 173,000 gsf in T Building)

Physical Assets

9. Utilities and Infrastructure

- Underground Utilities
- Above Ground Utilities
- Roads, Parking and Sidewalks

Physical Assets

9. Underground Utilities

- Water System
- Sanitary Sewer System
- Storm Sewer System
- Electric Service

Physical Assets

9. Above Ground Utilities

- Stanchion Lines
  - Steam
  - Chilled Water
  - Natural Gas
  - Miscellaneous
- Electric Service

Physical Assets

9. Roads, Parking and Sidewalks

- Roads
- Parking
- Sidewalks

Market for Reuse

Due Diligence Summary

- **1,346,500** gsf of Existing Space
  - **281,900** gsf of Office Space
  - **898,800** gsf of R&D Space
  - **165,800** gsf other uses

- **856,100** gsf of Space with Potential for Reuse
  - **252,300** gsf of Office Space
  - **517,300** gsf of R&D Space
  - **86,500** gsf other uses

- Site Utility Premiums

- Market Competition

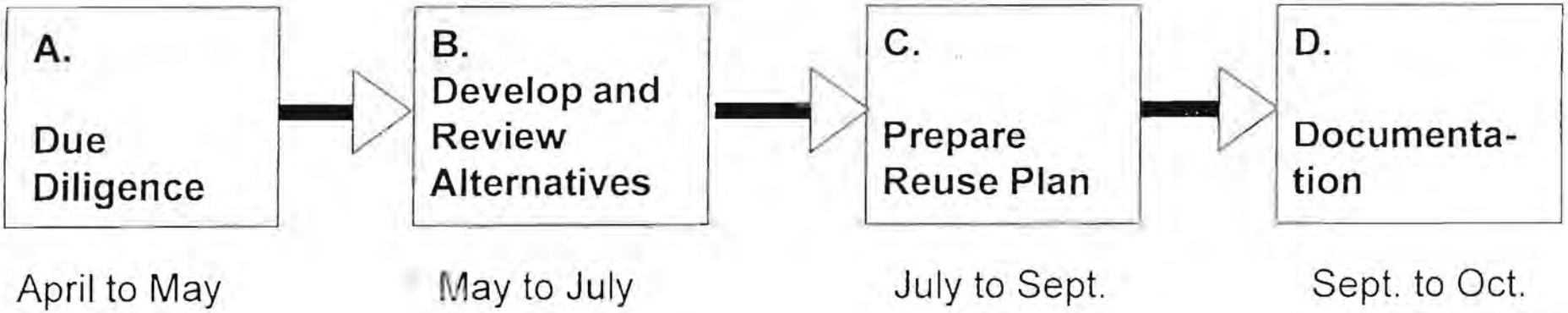
Redevelopment Potential

- South Parcel
- Lower Parking Area
- SM-PP Area

Next Steps

- Prepare Land Use Alternatives
- Refine Market Data
- Develop Financial Feasibility Model

The Planning Process



All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Building Use from URS	Building Use 1997 Camp	Existing Building Use	Condition 1997 CAMP	Building Shutdown	Leased to MMCIC	AGE (YRS)	Remaining Projected Useful Life	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP
1	Test Fire	C	Expl Prod Supp	1	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Poor			38		12 Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam
2	Test Fire	C	Explosives Testing	6.3	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Fair			43		17 Masonry Ext Walls	BUM Roof Carboline	Central Steam, Chilled Water
3	Test Fire	C	Explosives Testing	12.4	Laboratory	Laboratory	Lab / R&D / Lt. Ind	Fair			30		20 Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam, Chilled Water
4	SM-PP	D	Dosimetry	0.67			Storage / Support / Service								
5	Test Fire	D	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Fair			47		Reinforced 13 Concrete	Concrete	
6	Main Hill	C	Magazine	0.09	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate	Yes		47		Reinforced 13 Concrete	Concrete	
7	Main Hill	M	Magazine	0.4	Storage	Light Mfg./Warehouse	Storage / Support / Service	Fair	Yes		39		Reinforced 21 Concrete	Concrete	
8	Test Fire	R	Magazine	0.07	Storage	Light Mfg /Warehouse	Storage / Support / Service						Reinforced Concrete	Concrete	
10	Test Fire	C	Magazine	0.07	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate			9		Reinforced 51 Concrete	Concrete	
11	Main Hill	C	Magazine	0.4	Storage	Light Mfg /Warehouse	Storage / Support / Service	Fair	Yes		39		Reinforced 21 Concrete	Concrete	
13	SM-PP	E	Firing Shed	0.05			Storage / Support / Service								
14	SM-PP	E	Magazine (Old lead melting)	0.05			Storage / Support / Service								
16	Main Hill	R	Storage	0.5	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate	Yes		34		Steel Frame, Metal 16 Sides	Metal	
17	Main Hill	R	Warehouse	1.1	Storage	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Fair	Yes		34		Steel Frame, Metal 16 Sides	Metal	
19	Lower Area "B"	K	Salvage and Sales	4.5	Storage	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Good			32		18 Quonset Hut	Metal	Propane Forced Air, Wind AC
20	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Poor			32		Reinforced 18 Concrete	Concrete	
21	SM-PP	E	Raw Material Storage	4.1	Storage	Light Mfg /Warehouse	Storage / Support / Service	Poor			29		Reinforced 11 Concrete	Metal	
22	Lower Area "A"	C	Warehouse	9.1	Storage	Light Mfg /Warehouse	Storage / Support / Service	Good			30		20 Steel Frame	Metal	
23	Main Hill	M	Waste Material Staging	3.4	Storage	Light Mfg /Warehouse	Storage / Support / Service	Fair			29		Reinforced 11 Concrete	BUM Roof Asphalt	
24	Lower Area "B"	C	Potable Water Treatment	0.8	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Good			29		31 Masonry Ext Walls	BUM Roof Asphalt	Central Steam
25	Main Hill	Q	Weather Station	0.4	Service	Light Mfg./Warehouse	Storage / Support / Service	Poor			29		Reinforced 11 Concrete	BUM Roof Asphalt	Central Steam, Wind AC
26	Main Hill	Q	Maintenance Shop	0.8	Service	Light Mfg /Warehouse	Storage / Support / Service	Fair	Yes		30		10 Steel Frame	Metal	Elec Heat, Wind AC
27	Test Fire	C	Adv Dev Programs	5.3	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Poor			27		13 Masonry Ext Walls	BUM Roof Asphalt	
28	Main Hill	O	Ceramic Production	11.3	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Fair	Yes		29		21 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
29	Lower Area "A"	F	Adv Dev Plastics	6.6	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Poor	Yes		31		15 Masonry Ext Walls	BUM Roof Coaltar Metal	Central Steam, Chilled Water
30	SM-PP	F	Adv Dev & Health Phys	0.7	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Fair			31		19 Concrete Block	BUM Roof Coaltar	
31	SM-PP	I	Contaminated Waste	0.7	Storage	Light Mfg /Warehouse	Storage / Support / Service	Fair			29		Prefab/Metal# 11 Modular	Metal	
33	SM-PP	F	SM Area Maintenance	1.3	Service	Light Mfg /Warehouse	Storage / Support / Service	Fair			30		20 Masonry Ext Walls	BUM Roof Asphalt	

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Building Use from URS	Building Use 1997 Camp	Existing Building Use	Condition 1997 CAMP	Building Shutdown	Leased to MMCIC	AGE (YRS)	Remaining Projected Useful Life	Construction Type 1997 CAMP	Roof 1997 CAMP	HVAC 1997 CAMP
34	Lower Area "B"	J	Fire Training	1.1	Administration	Light Mfg /Warehouse	Office / Administration	Poor			30		10 Masonry Ext Walls	Concrete, Metal BUM Roof Asphalt	
35	Test Fire	C	Neutron Radiography	2.5	Laboratory	Laboratory	Lab / R&D / Lt. Ind.	Fair			29		11 Masonry Ext Walls	Metal	Central Steam, Chilled Water
36	SM-PP	F	RTG Support	4.3	Production	Laboratory	Lab / R&D / Lt. Ind.	Fair			27		13 Concrete Block	BUM Roof Asphalt	Central Steam
37	SM-PP	F	Adhesive Formulation	2.5	Production	Laboratory	Lab / R&D / Lt. Ind.	Fair			27		13 Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water
38	SM-PP	F	Nuc Opns Prog & D&D	44.3	Production	Laboratory	Lab / R&D / Lt. Ind.	Poor			25		5 Masonry Ext Walls	BUM Roof Asphalt	Central Steam
39	SM-PP	F	Nuclear Opns Support	3.5	Service	Office	Storage / Support / Service	Fair			28		22 Prefab/Metal	Metal BUM Roof Asphalt	Central Steam, Chilled Water
40	Main Hill	P	Printing Shop	12.2	Service	Office	Office / Administration	Good			27		33 Masonry Ext Walls	Metal	Central Steam, Chilled Water
42	Test Fire	C	High Expl Production	2.9	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Poor			26		14 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
43	Test Fire	C	Thermite Development	1.5	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Fair			25		15 Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water
44	SM-PP	F	Cafeteria	2.5	Administration	Office	Office / Administration	Fair			26		24 Masonry Ext Walls	BUM Roof Coaltar	Central Steam
45	Main Hill	L	Health Physics	2.8	Laboratory	Laboratory	Lab / R&D / Lt. Ind.	Good			24		26 Concrete Block	BUM Roof Coaltar	Central Steam, Chilled Water
46	Main Hill	I	Welding Dev	2.4	Laboratory	Laboratory	Lab / R&D / Lt. Ind.	Fair			25		15 Concrete Block	BUM Roof Asphalt	Central Steam, Chilled Water
47	Main Hill	O	Security	3.6	Administration	Office	Office / Administration	Excellent			26		34 Masonry Ext Walls Reinforced	BUM Roof, Asphalt	Central Steam, Chilled Water
48	Main Hill	Q	Surveillance	8	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Fair			24		26 Concrete	BUM Roof Coaltar	Central Steam, Chilled Water
49	Test Fire	C	Timer Fabrication	14.9	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Fair	Yes		25		25 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
50	SM-PP	F	RGT Assembly & Test	14.8	Production	Laboratory	Lab / R&D / Lt. Ind.	Adequate			24		46 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
51	Lower Area "A"	F	Development	3.5	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Fair			22		18 Steel Frame Reinforced	Metal	
52	Test Fire	C	Magazine	0.08	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate			23		37 Concrete Reinforced	Concrete	
53	SM-PP	E	Magazine	0.2	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate			9		51 Concrete Reinforced	Concrete	
54	Test Fire	D	Magazine	0.3	Storage	Lt. Industrial / Storage	Storage / Support / Service	Adequate			9		51 Concrete	Concrete	
55	Lower Area "B"	K	Waste Mgmt	0.3	Laboratory	Light Mfg /Warehouse	Storage / Support / Service	Adequate			21		9 Masonry Ext Walls	BUM Roof Coaltar	
56	Main Hill	M	Fire Pump	0.6	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Good			22		48 Masonry Ext Walls	BUM Roof Asphalt	Central Steam
57	Lower Area "B"	C	Sanitary Sewer Treatment	0.5	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Good			20		50 Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC
58	Main Hill	P	Filter Bank	6.1	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Good			17		33 Steel Frame Reinforced	BUM Roof Asphalt	Central Steam, Chilled Water
59	Test Fire	C	Neutron Radiography	0.7	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Poor			28		4 Concrete	Rolled Roof	
60	Main Hill	O	Ceramic Production	4	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Fair			15		35 Masonry Ext Walls Reinforced	BUM Roof Coaltar	Central Steam, Chilled Water
61	Lower Area "A"	G	Warehouse	45.5	Storage	Light Mfg /Warehouse	Lab / R&D / Lt. Ind.	Good			15		25 Concrete	Metal .06 EPDM	Central Steam, Chilled Water
63	Test Fire	C	Quality/Product Test	19.5	Production	Office	Lab / R&D / Lt. Ind.	Excellent	Yes		15		35 Masonry Ext Walls	BUM Roof Coaltar	

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64	Test Fire	C	Magazine	0.07	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		22		38 Concrete	Concrete	
65	Main Hill	O	Production Support	2.4	Production	Office	Lab / R&D / Lt. Ind	Fair	Yes		14		19 Prefab\Modular	Hypalon	
66	Lower Area "A"	F	Warehouse Support	0.6	Storage	Office	Lab / R&D / Lt. Ind	Excellent	Yes		18		19 Wood Frame\Prefab	Hypalon	Elec Heat Package
67	Test Fire	C	Energetic Material Supp	3.6	Production	Office	Lab / R&D / Lt. Ind	Fair			13		27 Concrete Reinforced	Metal	
68	Main Hill	P	D&D Staging Area	2	Storage	Light Mfg /Warehouse	Storage / Support / Service	Good			16		24 Metal	BUM Roof Asphalt	
69	Main Hill	Q	Production Supp	1.6	Administration	Office	Office / Administration	Fair		Yes	14		5 Prefab/Modular	Hypalon	Elec Heat Package AC
70	Main Hill	Q	Quality Supp	3.4	Administration	Office	Office / Administration	Fair		Yes	14		5 Prefab/Modular	Hypalon	Elec Heat Package AC
71	Lower Area "A"	G	Flammable Liquid Storage	0.8	Storage	Light Mfg /Warehouse	Storage / Support / Service	Good			12		28 Steel Framed\Prefab	Metal	
72	Lower Area "B"	K	Hazardous Waste Storage	2.4	Storage	Light Mfg /Warehouse	Storage / Support / Service	Good			12		18 Steel Frame	Metal	
73	Lower Area "A"	G	Gas Cylinder Storage	2.2	Storage	Light Mfg /Warehouse	Storage / Support / Service	Good			12		48 Steel Frame\Prefab	Metal	
74	Test Fire	C	Storage	0.4	Storage	Light Mfg /Warehouse	Storage / Support / Service	Fair			12		17 Steel Frame	Metal	
75	Main Hill	M	Waste Mgmt Supp	1.7	Administration	Office	Office / Administration	Fair			12		23 Wood/Modular	Hypalon	
80	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		9		51 Concrete Reinforced	Concrete	
81	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		9		51 Concrete Reinforced	Concrete	
82	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		9		51 Concrete Reinforced	Concrete	
83	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		9		51 Concrete Reinforced	Concrete	
84	Test Fire	C	Magazine	0.3	Storage	Light Mfg /Warehouse	Storage / Support / Service	Excellent	Yes		9		51 Concrete Reinforced	Concrete	
85	Test Fire	C	Power Blend/Process	5.2	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Excellent	Yes		7		63 Concrete Reinforced	Concrete BUM Roof Metal	Central Steam, Chilled Water
87	Test Fire	C	Explosives Testing	18.9	Laboratory	Laboratory	Lab / R&D / Lt. Ind	Excellent			8		42 Concrete	Coaltar	
88	SM-PP	F	RTG Admin Supp	7.2	Administration	Office	Office / Administration	Good			12		23 Prefab/Modular	Hypalon	Elec Heat Package AC
89	Main Hill	M	Detonator Storage	4.8	Storage	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Good			10		29 Concrete Reinforced	BUM Roof Asphalt	Central Steam Package AC
90	SM-PP	E	Retort (Explosive Waste)	0.7	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Good			12		58 Steel Frame	Metal	
91	Main Hill	N	Admin/Training	8.1	Administration	Office	Office / Administration	Fair			11		10 Modular	Hypalon	Package Heat & AC
92	Main Hill	R	Prod Training	1.6	Administration	Office	Office / Administration	Poor		Yes	11		2 Prefab/Modular	Hypalon	Package Heat & AC
93	Main Hill	O	Standards Supp	2.9	Administration	Office	Office / Administration	Autopsiu		Yes	11		5 Modular	Hypalon	Package Heat & AC
94	Lower Area "B"	C	Materials Compatibility	1.2	Laboratory	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Excellent			10		15 Prefab\Metal	Metal	
95	SM-PP	F	Utilities Operations-SM	2	Utility Plant	Office	Storage / Support / Service	Good			10		00 Prefab\Metal	Metal	
96	Main Hill	O	Armored Vehicle Shelter	0.4	Service	Light Mfg /Warehouse	Storage / Support / Service	Poor	Yes		11		9 Armco\Steel Sheet	Metal	
98	Lower Area "A"	H	Central Fire Station	8.9	Service	Office	Storage / Support / Service	Good			9		51 Masonry Ext Walls	Metal	Central Steam, Chilled Water

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99	Main Hill	P	Security Ops	11.4	Administration	Office	Office / Administration	Excellent			8		62 Reinforced Concrete	BUM Roof Coaltar	Central Steam, Chilled Water
100	SM-PP	D	Security Precinct	6.3	Administration	Office	Office / Administration	Excellent			7		63 Reinforced Concrete	BUM Roof	
101	SM-PP	F	Engrg Supp	1.8	Administration	Light Mfg /Warehouse	Office / Administration	Excellent			9		26 Wood Frame	Hypalon	Package Heat & AC
102	SM-PP	F	R.T.G. Program	11	Administration	Office	Office / Administration	Excellent			8		62 Precast Concrete	Metal	Hot Water, Chilled Water
104	Test Fire	M	Test Fire Maintenance	1.8	Service	Light Mfg /Warehouse	Storage / Support / Service	Excellent			5		55 Steel Framed	Metal	Central Steam, Chilled Water, Elec Heat
105	SM-PP	U	Parts Machining	38	Production	Light Mfg./Warehouse	Lab / R&D / Lt. Ind	Excellent		Yes	8		61 Steel Framed/ Cast Con	Metal	Hot Water, Chilled Water
106	Test Fire	C	Production Storage	0.2	Storage	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Excellent			11		49 Metal	Metal	
110	Lower Area "B"	F	Fuel Storage Tanks	0			Storage / Support / Service								
112	Lower Area "B"	L	Sanitary Disposal Sand Filter	0.8	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Excellent			11		50 Steel Frame	Metal	Elec Heat
113	Lower Area "B"	C	Sanitary Disposal Dewatering	0.5	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Excellent			6		54 Steel Frame	Metal	Elec Heat
114	Main Hill	R	Nitrogen Seperation	0.03											
120	Lower Area "B"	F	Health Physics Storage	0.05											
A	Main Hill	N	Administration	55.6	Administration	Office	Office / Administration	Good			47		23 Masonry Ext Walls, Alum Window	BUM Roof Asphalt	Central Steam, Chilled Water
B	Main Hill	R	Adv Dev Inert Prod	27.7	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Good			47		23 Masonry Ext Walls	BUM Roof Coaltar & Carboline	Central Steam, Chilled Water
C	Main Hill	P	Records Storage	13.4	Storage	Office	Lab / R&D / Lt. Ind	Fair			47		13 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
COS	Main Hill	Q	Central Ops Supp	64.7	Production	Laboratory	Lab / R&D / Lt. Ind	Excellent		Yes	9		61 Steel Frame Brick Veneer	BUM Roof Coaltar	Central Steam, Chilled Water
DS	Main Hill	D	Dev. & Stds. Lab	47.8	Laboratory	Laboratory	Lab / R&D / Lt. Ind	Fair			29		21 Masonry Ext Walls	BUM Roof Asphalt	Central Steam, Chilled Water
E	Main Hill	P	Adv Dev Production	29.8	Production	Laboratory	Lab / R&D / Lt. Ind	Fair			47		15 Masonry Ext Walls	BUM Roof Coaltar PH2-MET	Central Steam, Chilled Water
E Annex	Main Hill	P	Offices	18	Production	Laboratory	Lab / R&D / Lt. Ind	Fair			47		15 Masonry Ext Walls	BUM Roof Coaltar PH2-MET	Central Steam, Chilled Water
EG-1	Main Hill	R	Electrical Generator	0.24			Storage / Support / Service								
EG-2	SM-PP	F	Electrical Generator	0.24			Storage / Support / Service								
EG-4	Main Hill	Q	Electrical Generator	0.18			Storage / Support / Service								
EG-6	Main Hill	R	Electrical Generator	0.24			Storage / Support / Service								
EG-7	Test Fire	C	Electrical Generator	0.06			Storage / Support / Service								
G	Main Hill	O	Garage	7.5	Service	Light Mfg /Warehouse	Storage / Support / Service	Fair			47		23 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Wind AC
GH	Main Hill	H	Employment	5.3	Administration	Office	Office / Administration	Good		Yes	47		10 Masonry Ext Walls	BUM Roof Coaltar	Central Steam Package HVAC Units
GIS	Main Hill	H	Guard Island	0.2	Administration	Office	Office / Administration	Fair		Yes	47		10 Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC
GH1	Main Hill	H	Guard Post #1	0.8	Service	Mfg	Storage / Support / Service	Good			46		14 Reinforced Concrete Brick Veneer	BUM Roof Coaltar & Asphalt & Carboline	Central Steam, Chilled Water Package HVAC Units

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GP4a	SM-PP	F	Clothing Issue	0.4	Service	Light Mfg /Warehouse	Storage / Support / Service	Fair			32		18 Masonry Ext Walls	BUM Roof Asphalt	Elec Heat, Wind AC
GW	Main Hill	O	Bonded Stores	9.8	Storage	Office	Lab / R&D / Lt. Ind	Fair			27		23 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
H	Main Hill	P	Laundry	17.3	Service	Light Mfg /Warehouse	Storage / Support / Service	Fair			47		23 Masonry Ext Walls	BUM Roof Asphalt Coaltar	Central Steam, Chilled Water
HH	Main Hill	Q	Isotope Separation	15.3	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Good			47		23 Reinforced Concrete	BUM Roof Coaltar Metal	Central Steam, Chilled Water
I	Main Hill	R	High Expl Proc	25.7	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Poor			47		8 Masonry Ext Walls	BUM Roof Coaltar Asphalt Rolled Metal	Central Steam, Chilled Water
M	Main Hill	P	Machine/Elect Shops	56	Production	Light Mfg /Warehouse	Lab / R&D / Lt. Ind	Good			47		23 Masonry Ext Walls	BUM Roof Coaltar Asphalt	Central Steam, Chilled Water
OSE	Main Hill	N	Opns Supp (E)	90.1	Administration	Office	Office / Administration	Excellent			9		61 Steel Frame, Brick Veneer, Alum Wind	BUM Roof Coaltar	Central Steam, Chilled Water
OSW	Main Hill	N	Opns Supp (W)	54.3	Administration	Office	Office / Administration	Good			21		49 Masonry Ext Walls Alum Wind	BUM Roof Coaltar	Central Steam, Chilled Water
P	Main Hill	D	Power House Main Hill	15.1	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Adequate			47		13 Masonry Ext Walls	BUM Roof Carboline Coaltar	Central Steam, Packag AC, Wind AC
PH	Main Hill	C	Power House	0.646	Storage	Light Mfg /Warehouse	Storage / Support / Service	Adequate			47		13 Masonry Ext Walls	BUM Roof Coaltar	Central Steam
PS	Main Hill	O	Paint Shop	2.3	Service	Light Mfg /Warehouse	Storage / Support / Service	Good			32		18 PrefabMetalModul ar	Metal	Central Steam
R	Main Hill	R	Research Lab	58	Laboratory	Laboratory	Lab / R&D / Lt. Ind	Fair			46		24 Masonry Ext Walls	BUM Roof Coaltar	Central Steam, Chilled Water
SD	Main Hill	M	Sanitary Treatment (Not in Service)	1.9	Utility Plant	x	Storage / Support / Service	Poor			47		0 Concrete	BUM Roof Coaltar	Central Steam Not in Use
SM*	SM-PP	F	Demolished Nuclear Production Building	0			Lab / R&D / Lt. Ind								
SST	SM-PP	E	Salt Storage	0.6	Storage	x	Storage / Support / Service	Adequate			22		38 Wood Frame		None
SW	Main Hill	R	Tritium R&D	43.1	Laboratory	Laboratory	Lab / R&D / Lt. Ind	Fair			44		26 Masonry Ext Walls	BUM Roof Carboline Asphalt Coaltar	Central Steam, Chilled Water
T	Main Hill	O	Nuclear Operations	173	Production	Laboratory	Lab / R&D / Lt. Ind	Good			47		33 Reinforced Concrete	BUM Roof Carboline Asphalt Coaltar	Central Steam, Chilled Water
W	Main Hill	O	Maintenance Shops	32.5	Service	Light Mfg /Warehouse	Storage / Support / Service	Good			47		23 Masonry Ext Walls	BUM Roof Coaltar & Carboline & Asphalt & Metal	Central Steam, Chilled Water
WD	Main Hill	M	Radioactive Waste Treatment	16.2	Utility Plant	Light Mfg /Warehouse	Storage / Support / Service	Adequate			41		23 ConcreteConcrete Block	BUM Roof Asphalt Concrete	Central Steam, Chilled Water
WH1	Lower Area "B"	I	Well House	0.6	Utility Plant	Support / Service	Storage / Support / Service	Good			47		13 Metal Ext Walls	Metal	Elec Heat
WH2	Lower Area "B"	I	Well House	0.6	Utility Plant	Support / Service	Storage / Support / Service	Good			35		25 Masonry Ext Walls	BUM Roof Coaltar	Elec Heat
WH3	Lower Area "B"	I	Well House	0.6	Utility Plant	Support / Service	Storage / Support / Service	Good			35		25 Masonry Ext Walls	BUM Roof Coaltar	Elec Heat
			Total	1346.5											

* Note - Building SM was demolished prior to commencement of the Miamisburg Mound Reuse Plan--the 21,000 gsf of space within this building has not been carried in this building inventory

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Buildings with no Reuse Potential	Buildings with "Low Reuse Potential	Buildings with "High" Reuse Potential	Buildings Identified for Reuse by MMCIC	Environmental Concerns	Buildings to be Removed by DOE	Reuse Potential
1	Test Fire	C	Expl Prod Supp	Unwanted by MMCIC					Yes	No
2	Test Fire	C	Explosives Testing	Unwanted by MMCIC						No
3	Test Fire	C	Explosives Testing		Facility Survey Correction Report		Yes			Yes
4	SM-PP	D	Dosimetry		Added from ICP					Yes
5	Test Fire	D	Magazine	Report Recommendation					Yes	No
6	Main Hill	C	Magazine	Report Recommendation					Yes	No
7	Main Hill	M	Magazine	Report Recommendation					Yes	No
8	Test Fire	R	Magazine	Report Recommendation					Yes	No
10	Test Fire	C	Magazine	Report Recommendation					Yes	No
11	Main Hill	C	Magazine	Unwanted by MMCIC					Yes	No
13	SM-PP	E	Firing Shed	Added from ICP					Yes	No
14	SM-PP	E	Magazine (Old lead melting)		Added from ICP					Yes
16	Main Hill	R	Storage	Unwanted by MMCIC						No
17	Main Hill	R	Warehouse	Unwanted by MMCIC						No
19	Lower Area "B"	K	Salvage and Sales			Team Assessment				Yes
20	Test Fire	C	Magazine	Report Recommendation					Yes	No
21	SM-PP	E	Raw Material Storage	Unwanted by MMCIC					Yes	No
22	Lower Area "A"	C	Warehouse		Environmental Report					Yes
23	Main Hill	M	Waste Material Staging	Report Recommendation						No
24	Lower Area "B"	C	Potable Water Treatment		Keep for Infrastructure (MMCIC)					Yes
25	Main Hill	O	Weather Station	Unwanted by MMCIC					Yes	No
26	Main Hill	O	Maintenance Shop	Unwanted by MMCIC						No
27	Test Fire	C	Adv Dev Programs		Facility Survey Correction Report		Yes			Yes
28	Main Hill	D	Ceramic Production			Team Assessment	Yes			Yes
29	Lower Area "A"	F	Adv Dev Plastics	Unwanted by MMCIC						No
30	SM-PP	F	Adv Dev & Health Phys	Unwanted by MMCIC						No
31	SM-PP	F	Contaminated Waste	Unwanted by MMCIC					Yes	No
33	SM-PP	F	SM Area Maintenance	Unwanted by MMCIC					Yes	No

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Buildings with no Reuse Potential	Buildings with "Low Reuse Potential	Buildings with "High" Reuse Potential	Buildings Identified for Reuse by MMCIC	Environmental Concerns	Buildings to be Removed by DOE	Reuse Potential
34	Lower Area "B"	J	Fire Training	Unwanted by MMCIC					Yes	No
35	Test Fire	C	Neutron Radiography		Facility Survey Correction Report		Yes			Yes
36	SM-PP	F	RTG Support		Team Assessment					Yes
37	SM-PP	F	Adhesive Formulation		Team Assessment					Yes
38	SM-PP	F	Nuc Opns Prog & D&D	Team Assessment					Yes	No
39	SM-PP	F	Nuclear Opns Support	Unwanted by MMCIC						No
40	Main Hill	P	Printing Shop			Team Assessment	Yes			Yes
42	Test Fire	C	High Expl Production	Unwanted by MMCIC						No
43	Test Fire	C	Thermite Development	Unwanted by MMCIC						No
44	SM-PP	F	Cafeteria		Team Assessment					Yes
45	Main Hill	L	Health Physics			Team Assessment	Yes			Yes
46	Main Hill	L	Welding Dev		Facility Survey Correction Report		Yes			Yes
47	Main Hill	O	Security		Team Assessment				Yes	Yes
48	Main Hill	Q	Surveillance		Team Assessment		Yes			Yes
49	Test Fire	C	Timer Fabrication			Facility Survey Correction Report	Yes			Yes
50	SM-PP	F	RGT Assembly & Test		Team Assessment					Yes
51	Lower Area "A"	F	Development	Unwanted by MMCIC						No
52	Test Fire	C	Magazine	Report Recommendation					Yes	No
53	SM-PP	E	Magazine	Report Recommendation					Yes	No
54	Test Fire	Q	Magazine	Unwanted by MMCIC					Yes	No
55	Lower Area "B"	K	Waste Mgmt		Keep for Infrastructure (MMCIC)				Yes	Yes
56	Main Hill	M	Fire Pump		Keep for Infrastructure (MMCIC)					Yes
57	Lower Area "B"	C	Sanitary Sewer Treatment		Infrastructure (MMCIC)					Yes
58	Main Hill	R	Filter Bank	Report Recommendation					Yes	No
59	Test Fire	C	Neutron Radiography	Unwanted by MMCIC					Yes	No
60	Main Hill	O	Ceramic Production		Facility Survey Correction Report		Yes			Yes
61	Lower Area "A"	G	Warehouse			Team Assessment	Yes			Yes
62	Test Fire	C	Quality/Product Test			Facility Survey Correction Report	Yes			Yes

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Buildings with no Reuse Potential	Buildings with "Low Reuse Potential	Buildings with "High" Reuse Potential	Buildings Identified for Reuse by MMCIC	Environmental Concerns	Buildings to be Removed by DOE	Reuse Potential
64	Test Fire	C	Magazine	Report Recommendation					Yes	No
65	Main Hill	O	Production Support	Unwanted by MMCIC						No
66	Lower Area "A"	F	Warehouse Support	Unwanted by MMCIC						No
67	Test Fire	C	Energetic Material Supp	Unwanted by MMCIC						No
68	Main Hill	P	D&D Staging Area	Unwanted by MMCIC						No
69	Main Hill	Q	Production Supp	Unwanted by MMCIC						No
70	Main Hill	Q	Quality Supp	Unwanted by MMCIC						No
71	Lower Area "A"	G	Flammable Liquid Storage		Report Recommendation				Yes	Yes
72	Lower Area "B"	K	Hazardous Waste Storage	Report Recommendation						No
73	Lower Area "A"	G	Gas Cylinder Storage		Report Recommendation					Yes
74	Test Fire	C	Storage	Unwanted by MMCIC					Yes	No
79	Main Hill	M	Waste Mgmt Supp	Report Recommendation					Yes	No
80	Test Fire	C	Magazine		Occupied by Star City				Yes	Yes
81	Test Fire	C	Magazine		Occupied by Star City				Yes	Yes
82	Test Fire	C	Magazine		Occupied by Star City				Yes	Yes
83	Test Fire	C	Magazine		Occupied by Star City				Yes	Yes
84	Test Fire	C	Magazine		Occupied by Star City				Yes	Yes
85	Test Fire	C	Power Blend/Process		Team Assessment					Yes
87	Test Fire	C	Explosives Testing		Facility Survey Correction Report		Yes			Yes
88	SM-PP	F	RTG Admin Supp	Team Assessment						No
89	Main Hill	M	Detonator Storage		Team Assessment		Yes			Yes
90	SM-PP	E	Relon (Explosive Waste)	Already Removed						No
91	Main Hill	N	Admin/Training	Report Recommendation					Yes	No
92	Main Hill	R	Prod Training	Unwanted by MMCIC						No
93	Main Hill	Q	Standards Supp	Unwanted by MMCIC						No
94	Lower Area "B"	C	Materials Compatibility		Team Assessment					Yes
95	SM-PP	F	Utilities Operations-SM	Unwanted by MMCIC						No
96	Main Hill	O	Armored Vehicle Shelter	Unwanted by MMCIC						No
98	Lower Area "A"	F	Central Fire Station		Team Assessment					Yes

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Buildings with no Reuse Potential	Buildings with "Low Reuse Potential	Buildings with "High" Reuse Potential	Buildings Identified for Reuse by MMCIC	Environmental Concerns	Buildings to be Removed by DOE	Reuse Potential
99	Main Hill	P	Security Ops			Team Assessment	Yes			Yes
100	SM-PP	D	Security Precinct			Facility Survey Correction Report	Yes			Yes
101	SM-PP	F	Engrg Supp	Unwanted by MMCIC						No
102	SM-PP	F	R.T.G. Program			Team Assessment	Yes			Yes
104	Test Fire	M	Test Fire Maintenance			Facility Survey Correction Report	Yes			Yes
105	SM-PP	D	Parts Machining			Facility Survey Correction Report	Yes			Yes
108	Test Fire	C	Production Storage	Report Recommendation						No
110	Lower Area "D"	F	Fuel Storage Tanks	Added from ICP					Yes	No
112	Lower Area "H"	C	Sanitary Disposal Sand Filter		Keep for Infrastructure (MMCIC)					Yes
113	Lower Area "B"	C	Sanitary Disposal Dewatering		Keep for Infrastructure (MMCIC)					Yes
114	Main Hill	R	Nitrogen Seperation	Added from ICP					Yes	No
120	Lower Area "B"	F	Health Physics Storage		Added from ICP					Yes
A	Main Hill	N	Administration			Team Assessment	Yes			Yes
B	Main Hill	R	Adv Dev Inert Prod		Facility Survey Correction Report		Yes			Yes
C	Main Hill	P	Records Storage	Unwanted by MMCIC					Yes	No
COS	Main Hill	Q	Central Ops Supp			Facility Survey Correction Report	Yes			Yes
DS	Main Hill	Q	Dev. & Stds. Lab		Facility Survey Correction Report		Yes			Yes
E	Main Hill	P	Adv Dev Production		Facility Survey Correction Report		Yes		Yes	Yes
E-Annex	Main Hill	P	Offices		Facility Survey Correction Report		Yes		Yes	Yes
EG-1	Main Hill	R	Electrical Generator	Added from ICP					Yes	No
EG-2	SM-PP	F	Electrical Generator		Added from ICP					Yes
EG-4	Main Hill	Q	Electrical Generator	Added from ICP					Yes	No
EG-6	Main Hill	R	Electrical Generator	Added from ICP					Yes	No
EG-7	Test Fire	C	Electrical Generator	Added from ICP					Yes	No
G	Main Hill	O	Garage			Team Assessment	Yes			Yes
GI	Main Hill	H	Employment			Facility Survey Correction Report	Yes			Yes
GIS	Main Hill	H	Guard Island	Unwanted by MMCIC						No
GH	Main Hill	N	Guard Post #1	Unwanted by MMCIC			Yes			No

All Buildings Sorted by Building ID

Building ID	Planning District	Release Block	Description	Buildings with no Reuse Potential	Buildings with "Low Reuse Potential	Buildings with "High" Reuse Potential	Buildings Identified for Reuse by MMCIC	Environmental Concerns	Buildings to be Removed by DOE	Reuse Potential
GP44	SM-PP	F	Clothing Issue	Team Assessment					Yes	No
GW	Main Hill	O	Bonded Stores			Team Assessment				Yes
H	Main Hill	P	Laundry	Report Recommendation						No
HH	Main Hill	Q	Isotope Separation	Unwanted by MMCIC					Yes	No
I	Main Hill	R	High Expl Prod		Facility Survey Correction Report		Yes			Yes
M	Main Hill	P	Machine/Elect Shops		Team Assessment		Yes			Yes
OSE	Main Hill	N	Opns Supp (E)			Team Assessment	Yes			Yes
OSW	Main Hill	N	Opns Supp (W)			Team Assessment	Yes			Yes
P	Main Hill	D	Power House Main Hill		Team Assessment					Yes
PH	Main Hill	C	Power House		Team Assessment					Yes
PS	Main Hill	O	Paint Shop	Unwanted by MMCIC					Yes	No
R	Main Hill	R	Research Lab	Unwanted by MMCIC					Yes	No
SD	Main Hill	M	Sanitary Treatment (Not in Service)	Unwanted by MMCIC					Yes	No
SM*	SM-PP	F	Demolished Nuclear Production Building	Added from ICP					Yes	No
SST	SM-PP	E	Salt Storage		Team Assessment					Yes
SW	Main Hill	R	Tritium R&D	Unwanted by MMCIC					Yes	No
T	Main Hill	Q	Nuclear Operations	Unwanted by MMCIC						No
W	Main Hill	O	Maintenance Shops			Facility Survey Correction Report	Yes			Yes
WD	Main Hill	M	Radioactive Waste Treatment	Report Recommendation					Yes	No
WH1	Lower Area "B"	I	Well House		Keep for Infrastructure (MMCIC)					Yes
WH2	Lower Area "B"	I	Well House		Keep for Infrastructure (MMCIC)					Yes
WH3	Lower Area "B"	I	Well House		Keep for Infrastructure (MMCIC)					Yes
			Total							

* - Note - Building SM was demolished prior to commencement of the within this building has not been carried in this building inventory

Buildings with Potential for Reuse

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use
22	Lower Area "A"	C	Warehouse	9.1	Storage / Support / Service
61	Lower Area "A"	G	Warehouse	45.5	Lab / R&D / Lt. Ind
71	Lower Area "A"	G	Flammable Liquid Storage	0.8	Storage / Support / Service
73	Lower Area "A"	G	Gas Cylinder Storage	2.2	Storage / Support / Service
98	Lower Area "A"	F	Central Fire Station	8.5	Storage / Support / Service
	Lower Area "A" Total			**66.1**	
19	Lower Area "B"	K	Salvage and Sales	4.5	Lab / R&D / Lt. Ind
24	Lower Area "B"	C	Potable Water Treatment	0.8	Storage / Support / Service
55	Lower Area "B"	K	Waste Mgmt	0.3	Storage / Support / Service
57	Lower Area "B"	C	Sanitary Sewer Treatment	0.5	Storage / Support / Service
94	Lower Area "B"	C	Materials Compatibility	1.2	Lab / R&D / Lt. Ind
112	Lower Area "B"	C	Sanitary Disposal Sand Filter	0.8	Storage / Support / Service
113	Lower Area "B"	C	Sanitary Disposal Dewatering	0.5	Storage / Support / Service
120	Lower Area "B"	F	Health Physics Storage	0.05	
WH1	Lower Area "B"	I	Well House	0.6	Storage / Support / Service
WH2	Lower Area "B"	I	Well House	0.6	Storage / Support / Service
WH3	Lower Area "B"	I	Well House	0.6	Storage / Support / Service
	Lower Area "B" Total			**10.45**	
28	Main Hill	O	Ceramic Production	11.3	Lab / R&D / Lt. Ind
40	Main Hill	P	Printing Shop	12.2	Office / Administration
45	Main Hill	L	Health Physics	2.8	Lab / R&D / Lt. Ind
46	Main Hill	L	Welding Dev.	2.4	Lab / R&D / Lt. Ind
47	Main Hill	O	Security	3.6	Office / Administration
48	Main Hill	Q	Surveillance	8	Lab / R&D / Lt. Ind
56	Main Hill	M	Fire Pump	0.6	Storage / Support / Service

Buildings with Potential for Reuse

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use
60	Main Hill	O	Ceramic Production	4	Lab / R&D / Lt. Ind
89	Main Hill	M	Detonator Storage	4.8	Lab / R&D / Lt. Ind
99	Main Hill	P	Security Ops	11.4	Office / Administration
A	Main Hill	N	Administration	55.6	Office / Administration
B	Main Hill	R	Adv Dev Inert Prod	27.7	Lab / R&D / Lt. Ind
COS	Main Hill	Q	Central Ops Supp	64.7	Lab / R&D / Lt. Ind
DS	Main Hill	Q	Dev. & Stds. Lab	47.8	Lab / R&D / Lt. Ind
E	Main Hill	P	Adv Dev Production	29.8	Lab / R&D / Lt. Ind
E-Annex	Main Hill	P	Offices	18	Lab / R&D / Lt. Ind
G	Main Hill	O	Garage	7.5	Storage / Support / Service
GH	Main Hill	H	Employment	5.3	Office / Administration
GW	Main Hill	O	Bonded Stores	9.8	Lab / R&D / Lt. Ind
I	Main Hill	R	High Expl Prod	25.7	Lab / R&D / Lt. Ind
M	Main Hill	P	Machine/Elect Shops	56	Lab / R&D / Lt. Ind
OSE	Main Hill	N	Opns Supp (E)	90.1	Office / Administration
OSW	Main Hill	N	Opns Supp (W)	54.3	Office / Administration
P	Main Hill	O	Power House Main Hill	15.1	Storage / Support / Service
PH	Main Hill	C	Power House	0.646	Storage / Support / Service
W	Main Hill	O	Maintenance Shops	32.5	Storage / Support / Service
	Main Hill Total			**601.646**	
4	SM-PP	D	Dosimetry	0.67	Storage / Support / Service
14	SM-PP	E	Magazine (Old lead melting)	0.05	Storage / Support / Service
36	SM-PP	F	RTG Support	4.3	Lab / R&D / Lt. Ind
37	SM-PP	F	Adhesive Formulation	2.5	Lab / R&D / Lt. Ind
44	SM-PP	F	Cafeteria	2.5	Office / Administration
50	SM-PP	F	RGT Assembly & Test	14.8	Lab / R&D / Lt. Ind
100	SM-PP	D	Security Precinct	6.3	Office / Administration
102	SM-PP	F	R.T.G. Program	11	Office / Administration
105	SM-PP	D	Parts Machining	38	Lab / R&D / Lt. Ind

Buildings with Potential for Reuse

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use		
EG-2	SM-PP	F	Electrical Generator	0.24	Storage / Support / Service		
SST	SM-PP	E	Salt Storage	0.6	Storage / Support / Service		
	SM-PP Total			80.96			
3	Test Fire	C	Explosives Testing	12.4	Lab / R&D / Lt. Ind		
27	Test Fire	C	Adv Dev Programs	5.3	Lab / R&D / Lt. Ind		
35	Test Fire	C	Neutron Radiography	2.5	Lab / R&D / Lt. Ind		
49	Test Fire	C	Timer Fabrication	14.9	Lab / R&D / Lt. Ind		
63	Test Fire	C	Quality/Product Test	16.5	Lab / R&D / Lt. Ind		
80	Test Fire	C	Magazine	0.3	Storage / Support / Service		
81	Test Fire	C	Magazine	0.3	Storage / Support / Service		
82	Test Fire	C	Magazine	0.3	Storage / Support / Service		
83	Test Fire	C	Magazine	0.3	Storage / Support / Service		
84	Test Fire	C	Magazine	0.3	Storage / Support / Service		
85	Test Fire	C	Power Blend/Process	3.2	Lab / R&D / Lt. Ind		
87	Test Fire	C	Explosives Testing	38.9	Lab / R&D / Lt. Ind		
104	Test Fire	M	Test Fire Maintenance	1.8	Storage / Support / Service		
	Test Fire Total			97			
			Total	**856.16**			

Buildings with No Reuse Potential

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Buildings with no Reuse Potential
29	Lower Area "A"	F	Adv Dev Plastics	6.6	Lab / R&D / Lt. Ind	Unwanted by MMCIC
51	Lower Area "A"	F	Development	3.5	Lab / R&D / Lt. Ind	Unwanted by MMCIC
66	Lower Area "A"	F	Warehouse Support	0.6	Lab / R&D / Lt. Ind	Unwanted by MMCIC
	Lower Area "A" Total			**10.7**		
34	Lower Area "B"	J	Fire Training	1.1	Office / Administration	Unwanted by MMCIC
72	Lower Area "B"	K	Hazardous Waste Storage	2.4	Storage / Support / Service	Report Recommendation
110	Lower Area "B"	F	Fuel Storage Tanks	0	Storage / Support / Service	Added from ICP
	Lower Area "B" Total			**3.5**		
6	Main Hill	C	Magazine	0.09	Storage / Support / Service	Report Recommendation
7	Main Hill	M	Magazine	0.4	Storage / Support / Service	Report Recommendation
11	Main Hill	C	Magazine	0.4	Storage / Support / Service	Unwanted by MMCIC
16	Main Hill	R	Storage	0.5	Storage / Support / Service	Unwanted by MMCIC
17	Main Hill	R	Warehouse	1.1	Lab / R&D / Lt. Ind	Unwanted by MMCIC
23	Main Hill	M	Waste Material Staging	3.4	Storage / Support / Service	Report Recommendation
25	Main Hill	O	Weather Station	0.4	Storage / Support / Service	Unwanted by MMCIC
26	Main Hill	Q	Maintenance Shop	0.8	Storage / Support / Service	Unwanted by MMCIC
58	Main Hill	R	Filter Bank	6.1	Lab / R&D / Lt. Ind	Report Recommendation
65	Main Hill	O	Production Support	2.4	Lab / R&D / Lt. Ind	Unwanted by MMCIC
68	Main Hill	P	D&D Staging Area	2	Storage / Support / Service	Unwanted by MMCIC
69	Main Hill	Q	Production Supp	1.6	Office / Administration	Unwanted by MMCIC
70	Main Hill	Q	Quality Supp	3.4	Office / Administration	Unwanted by MMCIC
79	Main Hill	M	Waste Mgmt Supp	1.7	Office / Administration	Report Recommendation
91	Main Hill	N	Admin/Training	8.1	Office / Administration	Report Recommendation
92	Main Hill	R	Prod Training	1.6	Office / Administration	Unwanted by MMCIC
93	Main Hill	Q	Standards Supp	2.9	Office / Administration	Unwanted by MMCIC
96	Main Hill	O	Armored Vehicle Shelter	0.4	Storage / Support / Service	Unwanted by MMCIC
114	Main Hill	R	Nitrogen Seperation	0.03		Added from ICP
C	Main Hill	P	Records Storage	13.4	Lab / R&D / Lt. Ind	Unwanted by MMCIC
EG-1	Main Hill	R	Electrical Generator	0.24	Storage / Support / Service	Added from ICP

Buildings with No Reuse Potential

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Buildings with no Reuse Potential
EG-4	Main Hill	Q	Electrical Generator	0.14	Storage / Support / Service	Added from ICP
EG-6	Main Hill	R	Electrical Generator	0.24	Storage / Support / Service	Added from ICP
GIS	Main Hill	H	Guard Island	0.2	Office / Administration	Unwanted by MMCIC
GP1	Main Hill	N	Guard Post #1	7.8	Storage / Support / Service	Unwanted by MMCIC
H	Main Hill	P	Laundry	17.3	Storage / Support / Service	Report Recommendation
HH	Main Hill	Q	Isotope Separation	15.3	Lab / R&D / Lt. Ind	Unwanted by MMCIC
PS	Main Hill	O	Paint Shop	2.3	Storage / Support / Service	Unwanted by MMCIC
R	Main Hill	R	Research Lab	55	Lab / R&D / Lt. Ind	Unwanted by MMCIC
SD	Main Hill	M	Sanitary Treatment (Not in Service)	1.6	Storage / Support / Service	Unwanted by MMCIC
SW	Main Hill	R	Tritium R&D	43.1	Lab / R&D / Lt. Ind	Unwanted by MMCIC
T	Main Hill	Q	Nuclear Operations	173	Lab / R&D / Lt. Ind	Unwanted by MMCIC
WD	Main Hill	M	Radioactive Waste Treatment	16.2	Storage / Support / Service	Report Recommendation
	Main Hill Total			**383.14**		
13	SM-PP	E	Firing Shed	0.05	Storage / Support / Service	Added from ICP
21	SM-PP	E	Raw Material Storage	4.1	Storage / Support / Service	Unwanted by MMCIC
30	SM-PP	F	Adv Dev & Health Phys	0.7	Lab / R&D / Lt. Ind	Unwanted by MMCIC
31	SM-PP	F	Contaminated Waste	8.7	Storage / Support / Service	Unwanted by MMCIC
33	SM-PP	F	SM Area Maintenance	1.3	Storage / Support / Service	Unwanted by MMCIC
38	SM-PP	F	Nuc Opns Prog & D&D	44.3	Lab / R&D / Lt. Ind	Team Assessment
39	SM-PP	F	Nuclear Opns Support	3.5	Storage / Support / Service	Unwanted by MMCIC
53	SM-PP	E	Magazine	0.2	Storage / Support / Service	Report Recommendation
88	SM-PP	F	RTG Admin Supp	7.2	Office / Administration	Team Assessment
90	SM-PP	E	Retort (Explosive Waste)	0.7	Storage / Support / Service	Already Removed
95	SM-PP	F	Utilities Operations-SM	2	Storage / Support / Service	Unwanted by MMCIC
101	SM-PP	F	Engrg Supp	1.8	Office / Administration	Unwanted by MMCIC
GP44	SM-PP	F	Clothing Issue	0.4	Storage / Support / Service	Team Assessment
SM*	SM-PP	F	Demolished Nuclear Production Building	0	Lab / R&D / Lt. Ind	Added from ICP
	SM-PP Total			74.95		
1	Test Fire	C	Expl Prod Supp	1	Lab / R&D / Lt. Ind	Unwanted by MMCIC

Buildings with No Reuse Potential

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Buildings with no Reuse Potential
2	Test Fire	C	Explosives Testing	6.3	Lab / R&D / Lt. Ind	Unwanted by MMCIC
5	Test Fire	D	Magazine	0.3	Storage / Support / Service	Report Recommendation
8	Test Fire	R	Magazine	0.07	Storage / Support / Service	Report Recommendation
10	Test Fire	C	Magazine	0.07	Storage / Support / Service	Report Recommendation
20	Test Fire	C	Magazine	0.3	Storage / Support / Service	Report Recommendation
42	Test Fire	C	High Expl Production	2.9	Lab / R&D / Lt. Ind	Unwanted by MMCIC
43	Test Fire	C	Thermite Development	1.5	Lab / R&D / Lt. Ind	Unwanted by MMCIC
52	Test Fire	C	Magazine	0.08	Storage / Support / Service	Report Recommendation
54	Test Fire	Q	Magazine	0.3	Storage / Support / Service	Unwanted by MMCIC
59	Test Fire	C	Neutron Radiography	0.7	Lab / R&D / Lt. Ind	Unwanted by MMCIC
64	Test Fire	C	Magazine	0.07	Storage / Support / Service	Report Recommendation
67	Test Fire	C	Energetic Material Supp	3.8	Lab / R&D / Lt. Ind	Unwanted by MMCIC
74	Test Fire	C	Storage	0.4	Storage / Support / Service	Unwanted by MMCIC
106	Test Fire	C	Production Storage	0.2	Lab / R&D / Lt. Ind	Report Recommendation
EG-7	Test Fire	C	Electrical Generator	0.08	Storage / Support / Service	Added from ICP
	Test Fire Total			18.07		
			Total	490.36		
* - Note - Building SM was demolished prior to commencement of the Miamisburg Mound Reuse Plan--the 21,000 gsf of space within this building has not been carried in this building inventory						

Buildings with Potential for Reuse that are Scheduled to be Removed by the DOE

Building ID	Planning District	Release Block	Description	Square Footage (X1,000)	Existing Building Use	Buildings to be Removed by DOE	Reuse Potential
E	Main Hill	P	Adv Dev Production	29.8	Lab / R&D / Lt. Ind	Yes	Yes
E-Annex	Main Hill	P	Offices	18	Lab / R&D / Lt. Ind	Yes	Yes
47	Main Hill	O	Security	3.6	Office / Administration	Yes	Yes
71	Lower Area "A"	G	Flammable Liquid Storage	0.8	Storage / Support / Service	Yes	Yes
55	Lower Area "B"	K	Waste Mgmt	0.3	Storage / Support / Service	Yes	Yes
80	Test Fire	C	Magazine	0.3	Storage / Support / Service	Yes	Yes
81	Test Fire	C	Magazine	0.3	Storage / Support / Service	Yes	Yes
82	Test Fire	C	Magazine	0.3	Storage / Support / Service	Yes	Yes
83	Test Fire	C	Magazine	0.3	Storage / Support / Service	Yes	Yes
84	Test Fire	C	Magazine	0.3	Storage / Support / Service	Yes	Yes
			Total	54			

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Miamisburg Mound Comprehensive Reuse Plan

Development Options Summary
Draft Report
July 23, 1996

Prepared for:
Miamisburg Mound Community
Improvement Corporation

Prepared by:
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in association with
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ALTERNATIVES EVALUATION SUMMARY

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1. INTRODUCTION/PROCESS

Over the past five months, Sasaki Associates, Inc., in association with Economics Research Associates; URS Consultants; Hamilton, Rabinovitz and Alschuler; and Environmental Technologies and Communication have been working with the Miamisburg Mound Community Improvement Corporation (MMCIC), the Mound Reuse Committee (MRC) and the Department of Energy (DoE) to assess the opportunities and limitations that will influence future reuse of the Miamisburg Mound Plant (Mound). This analysis has explored at various levels of detail existing land and building uses on the property, condition of existing facilities, the capacity of the site to accommodate new development, the capacity and configuration of current infrastructure and the market potential for office, industrial and research space in the Dayton metropolitan area. In addition, the planning team has worked with the MMCIC, MRC and DoE to articulate the goals and expectations for reuse of the property.

Based on the information collected, three development options have been prepared which illustrate scenarios for reuse of the Mound. These plans establish a reuse strategy to facilitate the conversion of the Mound from a DoE facility into a private and economically viable complex of buildings within which jobs are creates that, at a minimum, replace the number lost through closure of the facility.

Given the character and use of the existing site and buildings, the preferred uses for the land (as reflected in the zoning for the land) and the market for space in the Miamisburg/Dayton area, the focus for the reuse options is a range of technical, R&D and light industrial uses. Within this framework the MMCIC is considering a series of reuse development options that have been set to consider a range of marketing and development strategies. Recognizing that the options are on a continuum ranging from "quick, inexpensive and open to all interested tenants", to "longer term, more investment and focused on a high value market", the options represent three "snap shots" along that continuum. The final selected option could rest at other points along the continuum and, in fact, adopt characteristics from any of the three options that are described.

The purpose of this report is to assess the strengths and weaknesses of each development option. In the work sessions and public meeting in Miamisburg on July 24-26, 1996 the planning team will work with the MMCIC, MRC, DoE and the community to get feedback on the various development options and establish a direction for the preferred plan.

There are three components to this report: 1) identification of the goals for reuse of the Mound which need to be incorporated into all three options; 2) a description

of the three development options including preliminary cost pro
evaluation of the three options.

2. GOALS AND OBJECTIVES

Through meetings and interviews with members of the MMCIC, MRC, DoE and the community, several recurrent goals and objectives have been identified. These goals have been organized around three predominant constituent groups: the *Community*, the *DoE* and the *MMCIC*. While the goals identified below have been attributed to a specific constituent group, they may in fact be shared by two or all three of the groups.

Community

- An environmentally clean site.
- A positive community physical and visual asset-a good neighbor.
- Jobs, salaries and salary tax contribution.
- Financially viable and self sufficient development.
- Maximize the Nation's peacetime return on public investments.
- An economic and technological asset for the region.

DoE

- Transition facility from Defense Programs to a commercial site.
- Eliminate DoE environmental liabilities.
- Eliminate landlord responsibilities
- Minimize Cleanup cost to tax payers.
- Complete cleanup and transition by 2005.

MMCIC

- Jobs and economic development--mitigate the economic impact of the closure upon the employees and community.
- Financially viable plan/proper balance between revenues, absorption pace, investment and operating costs.
- Achieve revenues sufficient to complete a successful transition

3. DESCRIPTION OF THE THREE DEVELOPMENT OPTIONS

For each development option, the market strategy is described first. This is followed by a description of the development strategy that is recommended for that market. Next is a listing of physical modifications or improvements that are recommended for the particular market and strategy, followed by a related operation and management strategy that is consistent with the alternative.

Reuse Option 1: Industrial Park

Under this option, capital investments are limited to those necessary to bring the property into compliance with codes, city standards and other legal requirements to make it economically viable as private real estate. The changes suggested also represent a baseline condition for the physical facilities under all the options. This development strategy will allow the MMCIC to turn over the property most quickly.

Market Strategy

- The Mound is identified as an industrial park (as opposed to a research and development park). Land and space are available to anyone interested and for all uses allowable under zoning.

- No effort is made to create any special identity or amenity. The focus is on sale or lease to the highest bidder for the use of his/her choice. The only condition is that bidders must take all of a given section of land and/or buildings in accordance with a "disposal" plan. No "cherry picking" is allowed.

- Jobs goals (salary and skill levels) are secondary to finding viable uses and reducing MMCIC time schedule for conversion of the Mound to private use.

Development Strategy

- Opportunities that reduce the time of involvement of MMCIC are sought.

- Investments required to bring the site into compliance with codes and city standards and make it economically viable for private use are minimized.

- An outside utility provides sewer, water and electric services. Heat and cooling is specific to each building or group of buildings.

- MMCIC operates as caretaker until the new owner(s)/operator(s) takes over.

Physical

- Road network improvements are limited to those necessary to bring roads up to city standards.

- Buildings are brought up to an acceptable level for code compliance. Beyond code-based upgrade, all existing buildings are to be used in "as is" condition unless (a) DoE has designated it for demolition; (b) MMCIC has indicated there is no potential for reuse; or (c) demolition is necessary to provide parking for existing development areas.

- Each building is given a free-standing boiler and chiller, or combined system where most economical, making use of existing internal distribution systems where they are reusable. Sewer, water and electric services are provided by other entities for a use fee.

- Overhead utility structures are demolished but the site is not otherwise improved. A utility corridor in the main road is constructed to service sites with gas and electric.

- Site improvements are limited to basic cleanup and upgrade of the stormwater management systems to an adequate level.

- Because of the development's industrial character, no investments in visual amenities such as special landscape, lighting and signage are made.

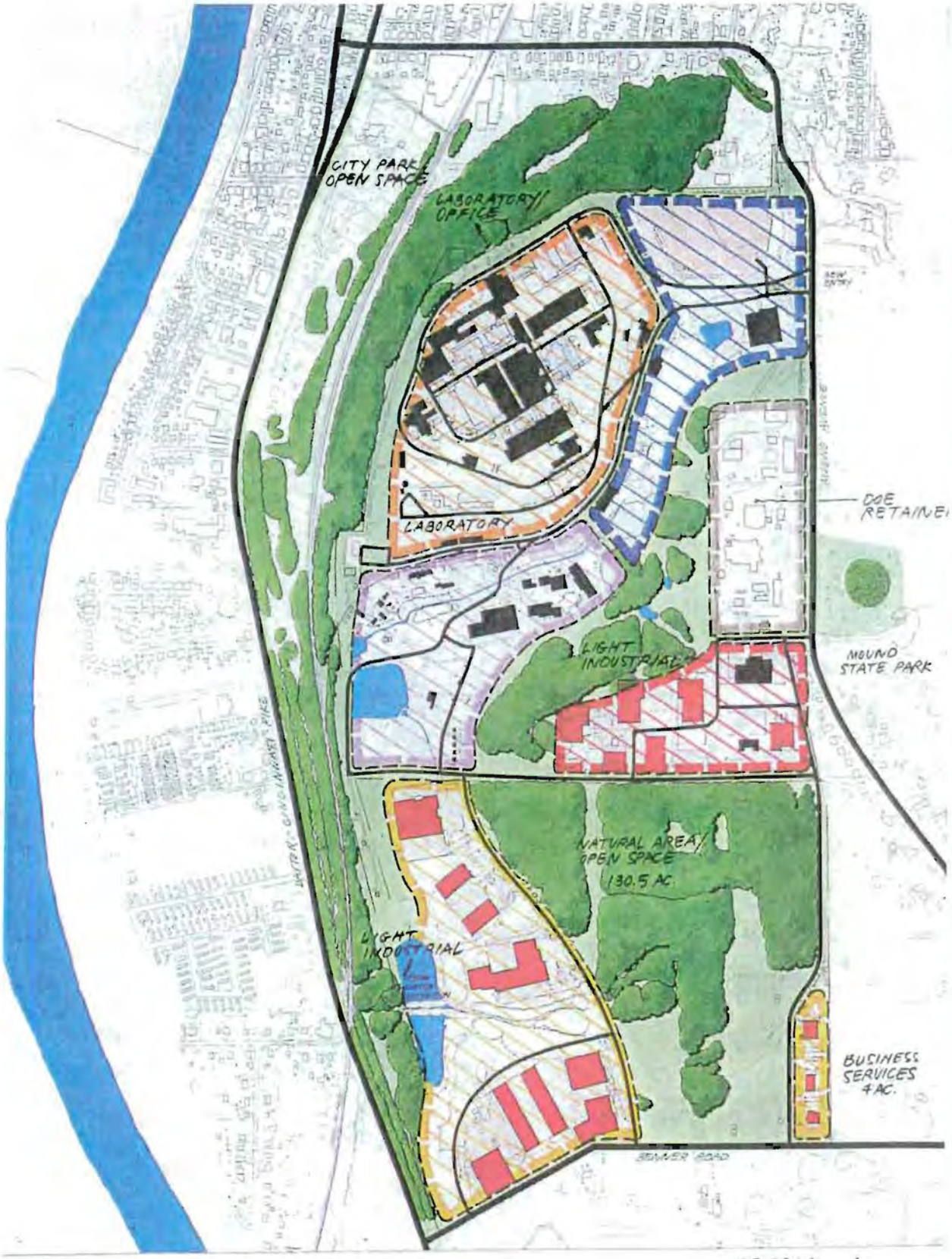
- Land at the south end of the site is sold in bulk with no improvements. Existing road frontage used for access.

Operation and Management

- O&M Costs brought to a level commensurate with competitive private developments.

- Any special features such as common open space areas that would result in management costs are minimized. Focus is on disposition rather than long term management.

- MMCIC remains in business until DOE transfers ownership, at which point the MMCIC becomes the "auctioneer" to move the property through to another owner(s).



OPTION 1

Miamisburg Mound Reuse Plan

Mound

July 1996

Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community Improvement Corporation

with

Sasaki Associates, Inc.

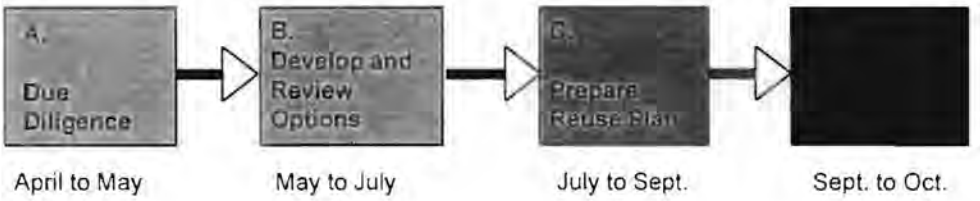
URS Consultants, Inc.
Economics Research Associates, Inc.
Hamilton Rabinovitz & Alschuler
Environmental Technologies, Inc.

Today's Presentation

Review Options

- Goals
- Methodology
- Assets and Liabilities
- Options for Reuse
- Evaluation of Options
- Selection of a Preferred Option

The Planning Process



Goals

1. Community

- Environmentally Clean Site
- Positive Visual and Physical Asset - A Good Neighbor
- Jobs, Salaries and Salary Tax Contribution
- Financially Viable and Self Sufficient Development
- Maximize the Peace Time Return on the Nation's Investment
- An Economic and Technological Asset for the Region

Goals
2. Department of Energy

- Transition the Site's Assets to the Commercial Marketplace
- Eliminate DoE's Environmental Liabilities
- Eliminate DoE's Landlord Responsibilities
- Minimize Clean Up Costs to Tax Payers
- Complete Clean Up and Transition by 2005

Goals
3. MMCIC

- Jobs and Economic Development
- Mitigate the Economic Impact of Closure Upon Employees and Community
- Financially Viable Plan
- Achieve Revenues Sufficient to Complete Transition

Methodology

A View from the Perspective of
Private Development

Methodology

Determination of Assets and Liabilities

- Buildings
- Infrastructure
- Site
- Market

Assets and Liabilities

Buildings

- Reuse 570,000 square feet to 800,000 square feet
- Demolish 550,000 square feet to 780,000 square feet
- Code Compliance

Assets and Liabilities

Utilities and Infrastructure

- Water
- Sewer
- Electric
- Storm Water
- Heating
- Cooling

Assets and Liabilities

Site

- Roads
- Parking
- Landscape Improvements

Assets and Liabilities

Site

- Additional Development Potential
- 52 Acres in the South 40
- Infill Potential on 20+ Acres

Assets and Liabilities

Market

- Office / Research and Development
- Industrial / Light Industrial
- Retail / Entertainment
- Residential
- Institutional

Options for Reuse

Option 1: Industrial Park

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 1: Industrial Park

Building Use

• Office	253,000 s.f.
• General Industry	240,000 s.f.
• Research and Development	150,000 s.f.
• Explosive	140,000 s.f.
• Infrastructure	13,000 s.f.
Total Reuse	**796,000 s.f.**
• New Construction	565,000 s.f.

Options for Reuse

Option 2: Industrial and Technology Center

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 2: Industrial and Technology Center

Building Use

• Office	235,000 s.f.
• General Industry	178,000 s.f.
• Research and Development	150,000 s.f.
• Explosive	131,000 s.f.
• Infrastructure	13,000 s.f.
Total Reuse	**707,000 s.f.**
• New Construction	715,000 s.f.

Options for Reuse

Option 3: Technology Center

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 3: Research Park

Building Use

• Office	235,000 s.f.
• General Industry	122,000 s.f.
• Research and Development	138,000 s.f.
• Explosive	70,000 s.f.
• Infrastructure	4,000 s.f.
Total Reuse	**569,000 s.f.**
• New Construction	800,000 s.f.

Evaluation of Options

Community Goals

- Environmentally Clean Site
- Positive Visual and Physical Asset - A Good Neighbor
- Jobs, Salaries and Salary Tax Contribution
- Financially Viable and Self Sufficient Development
- Maximize the Peace Time Return on the Nation's Investment
- An Economic and Technological Asset for the Region

Evaluation of Options

Department of Energy Goals

- Transition the Site's Assets to the Commercial Marketplace
- Eliminate DoE's Environmental Liabilities
- Eliminate DoE's Landlord Responsibilities
- Minimize Clean Up Costs to Tax Payers
- Complete Clean Up and Transition by 2005

Evaluation of Options

MMCIC Goals

- Jobs and Economic Development
- Mitigate the Economic Impact of Closure Upon Employees and Community
- Financially Viable Plan
- Achieve Revenues Sufficient to Complete Transition

Selection of a Preferred Option

- MMCIC and MRC Review of Options
- Public Review and Comment
- Board Review and Selection

Next Steps

- Finalize Land Use Plan
- Coordination with DoE Closure Strategy
- Refine Implementation Strategy

Assets and Liabilities

Planning Assumption:

Buildings are Transferred
in a Code Compliant Condition

Assets and Liabilities

Planning Assumption:

Utilities are Provided at Rates
Competitive with the Market

Assets and Liabilities

Planning Assumption:

Improvements are Made to the Site Including Upgrading Roadways to Local Standards and an Adequate Storm Drainage System

Assets and Liabilities

Planning Assumption:

An Economically Viable Development

Assets and Liabilities

Planning Assumption:

Options Seek Opportunities for Potential Cost Avoidance

- Reduced Facility Disposition Costs
- Reduced Surveillance & Maintenance Costs
- Reduced Decontamination and Decommissioning Costs
- Reduced Safe Shutdown Costs

Evaluation of Options 1

Community

- An environmentally safe closure is assumed.
- While environmentally safe, the lack of investment in amenities will limit the extent to which is will be seen as a physically attractive community asset.
- Salaries and tax contributions are lower than 2 and 3.
- While financially feasible, it is physically less attractive than 2.
- Given the goal of rapid exit by MMCIC and related community involvement, the community is more vulnerable to loss of control over the outcome of the conversion.

DoE

- Less economically attractive than other options.
- DoE's rapid exit goal is threatened.

MMCIC

- Risk to MMCIC will be reduced.
- A quick MMCIC exit will likely reduce the potential value of the transaction to MMCIC and, in turn, DoE.
- Transfer of the property to a private developer will reduce the ability for MMCIC to selectively market the property toward specific ends such as maximization of quality jobs.

Evaluation of Options 2

Community

- An environmentally safe cleanup is assumed.
- Increased investment in site and building improvements, increases the quality of the Mound as a private neighbor.
- Produces the highest number of high paying jobs, over the shortest period of time.
- Maximizes tax revenue.
- Success reduces risk and the potential of additional investment required of the community.

DoE

- Will have potentially less cleanup costs under this option, while enjoying the potential for a more rapid transition to a financially feasible development.

MMCIC

- This is the most financially feasible option.
- Jobs and economic benefits are maximized.
- The feasibility of keeping jobs and providing economic benefit to the community as a first priority is improved.
- There is a need for a successor public/private operator.

Evaluation of Options 3

Community

- An environmentally safe conversion is assumed.
- The most attractive to the community as an asset.
- The highest paying jobs.
- Significantly longer absorption period.
- Reduced potential for financial success.

DoE

- DoE cleanup costs potentially reduced under this option.
- The protracted absorption pace of this option increases the potential for MMCIC failure and the necessity for a continuing role for DoE.

MMCIC

- Not financially feasible because of a limited market.
- Results in a greatly extended time frame for implementation.
- Produces the most high paying jobs.
- Unable to create an "investment grade" property in which private developers will be interested in investing.

MOUND REUSE COMMITTEE COMMUNITY MEETING

Date: May 15, 1996
Time: 7:00 p.m.
Place: Miamisburg Civic Center

Attendance: Cheryl Baxter (Economic Research Associates), Dann Bird (MMMCIC), Dick Blauvelt (BDM Federal), Mike Brooks (SAM-SBDC at Mound), Ed Brown (URS Consultants), Bryan Choi (Architects Associated), Jack L. Clark (Jacobs Engineering), Dick Church, Randy Daniel (S. Metro Chamber), Ria Davidson (Environmental Technologies & Communications, Inc.), George C. Dunahue, Marcia Dunahue, Richard Fliterap, Charles Friedman (Selentec), Debbie Gill, John Gill, Mike Grauwelman, David Hirzel (Sasaki Associates, Inc.), Gordon S. Horn, Keith Johnson (City of Miamisburg), Art Kleinrath (DOE), John Maletta, Mike McCabe, Peggie McCabe, Martha McConnell (Environmental Technologies & Communications, Inc.), Brian Niuhed (Ohio EPA), Mady Randsdee (City Council, Miamisburg), Robert Shiffer, Carl Simmons, Joe Stanton (Teledyne), Gretchen Wahl (Jacobs Engineering), John Weithofer (MRC), Debbie White, Sheila Willis, Jim Zahora.

CONVENING OF MEETING

The meeting was convened at 7:00 p.m. by John Weithofer, Chairman of the Mound Reuse Committee (MRC).

ITEM 1 - INTRODUCTION & GOALS

Mr. Weithofer welcomed the attendees and explained that the MRC is seeking input and involvement from the community regarding the reuse of the Mound facility. He described the involvement process:

- the MRC will hold a series of public forum meetings (this was the first)
- the MRC meets on the second Friday of each month at 10 a.m. in the conference room at the Civic Center, individuals may call 847-6456 to be on the mailing list
- the purpose of tonight's meeting is to inform citizens, share information about the project goals, process, and timetable for the reuse plan.

Dann Bird welcomed attendees on behalf of the Miamisburg Mound Community Improvement Corporation, and explained that MMCIC is the lead economic development organization for determining Mound's options for reuse. Mr. Bird explained the group's goal of completing the reuse plan in what is usually a 12-15 month process within 7 months. Mr. Bird introduced Sasaki Associates and provided an overview of the agenda.

David Hirzel of Sasaki Associates expressed his pleasure at kicking off the reuse plan process, and introduced the team members.

- Ed Brown, URS Consultants
- Cheryl Baxter, Economic Research Associates
- Ria Davidson, Martha McConnell, Environmental Technologies & Communications

Mr. Hirzel provided a summary of the project timeline:

- at this meeting what is known about the site, buildings, development potential, issues involved, and market for reuse at this point in time will be discussed
- the next phase will involve determination of options

- another public meeting will be held the third week in July to review those options
- following the decision about the preferred direction of reuse for the facility, the reuse plan will be prepared for further review
- by September/October, there will be a completed reuse plan representing the MRC's, the MMCIC's, and the community's plan for the reuse

ITEM 2: SITE OPPORTUNITIES & CONSTRAINTS, BUILDING REUSE POTENTIAL, DEVELOPMENT POTENTIAL (See attached presentation)

Mr. Hirzel described the site: Main Hill, SM-PP area, Test Fire, Lower area (A & B), South Parcel (south 40), total site area is 300 acres.

Mr. Hirzel reviewed the regional context:
- Site is part of Dayton area; location plays a role in determining site opportunities
- Site is not on or visible from the main highway corridor (I-75) that is generating a lot of the economic development in the region. Improved access to the site is necessary
- Want to be sure that Mound is good neighbor to the Miamisburg community

Mr. Hirzel reviewed the natural resources on the site:
- Large underwater aquifer underlies development - not constraint to development
- Minor wetlands at low points through lower area of site - not constraint to development
- Due to the hundred-year flood plain, can't build where first floors are below flood level
- Vegetation - trees, fields - open space opportunities around hill
- Slopes are an issue - land that is at a slope of 15% or greater is difficult and expensive to develop. 42% of the site has significant slope constraint
- Soils (the fact that bedrock is just below the surface) further complicate slope issue -- 79% of site has soils that constrain new development

Mr. Hirzel indicated that an issue affecting the timing of development is the clean-up operation going on as DOE vacates the site. The buildings are the focus of the clean-up; completion of the clean-up and building demolition is scheduled for 2005.

Mr. Hirzel explained the breakdown of the site:
- net usable land area is 159 of the 300 acres
- about 1.3 million square feet of buildings currently exist on site
- about 850,000 square feet could have reuse potential
- DOE has already committed to removing many of unusable buildings

Ed Brown, URS Consultants, Inc., described the site utilities and infrastructure:
<u>Underground utilities</u>:
- Water system - 3 wells, 3 water towers, 2 water systems (domestic and fire) on site. Generally in good condition, buildings are not individually metered
- Sanitary sewer system -- wastewater sent to onsite treatment plant. In good condition
- Storm sewer system is made up of pipes, channels, and culverts. Needs some improvement
- Groundwater contamination is being cleaned up - involves volatile organic compounds
- Electric service - amount coming in is about twice what they use - have 100% backup to provide constant source of power. Buildings are not individually metered

<u>Aboveground utilities</u>:
- 2 boilers provide steam -- when buildings taken out, boiler will be less efficient - cost of facility may become prohibitive as cost per square foot goes up
- Chilled water is provided through two sources. Chillers range in age from '70s to 1985 - tremendous strides made in chiller technology over last 10 years, new ones more efficient.

- Stanchion lines - steam lines originate in power house, provide heat to whole facility. Chilled water lines serve most of the facilities
- Natural gas line runs aboveground - high-pressure gas line feeds boilers and powerhouse
- Stanchion lines also have lines used for nitrogen gas, helium, electrical conduits, compressed air system

Roads, parking, sidewalks:

- Main parking area in pretty good shape. Smaller parking area structurally sound. Larger parking areas on south side in poor condition.
- Roads throughout site in fair condition, but need upgrading to community standards

Mr. Hirzel provided a preview of development potential:

- Three most interesting pieces of vacant land are the south parcel, lower parking area, and parts of the SM-PP
- Top of the hill - a lot of buildings go away - must make the top of a hill function as a place where people can park next to their buildings
- Existing roads and frontage offer best early action opportunities because they avoid having to wait until 2005 when cleanup is done

ITEM 3: MARKET FOR REUSE

Cheryl Baxter, Economic Research Associates, indicated that the challenge is to find out what business opportunities exist for the site. DOE has been running a business operation there for 50 years - manufacturing, research and development, labs, offices, administration. Challenge is to find a fit between existing facilities and businesses/market opportunities.

Ms. Baxter indicated that the approach taken was to look at the current economy and real estate market, and also at technology. She described the results of the research:

- Local economy is healthy, growing, new businesses entering area
- Area is growing; growth is faster on north side of Dayton, but south is experiencing growth
- Location is critical - while the site is convenient to Dayton, businesses want to be located on the highway
- Office market is heavily concentrated in downtown. Office market is not strong right now - may not be critical because office space at Mound won't be available until 2005.
- There will be market for various types of industrial uses at Mound. MMCIC has been successful so far at attracting businesses and creating jobs. Over period of time, DOE will vacate buildings and businesses can move in.
- Key to making this work, because of buildings, lack of visability, and access from I-75, is low rent.

ITEM 4: QUESTIONS/COMMENTS

Q: Reference to base in Illinois that shut down, where residents were allowed to move onto base, airline company uses hangars, government also still uses facilities.

A: We want to understand the nature of the assets on Mound - facilities, equipment, buildings, skills of people, take advantage of what's unique about this place and suggest reuse strategy. The only generalization I would like to make is that I have yet to see reuse achieved by a magic bullet - it's always achieved by a lot of hard work one small step at a time, a group like the CIC working to take care of all the details and make it happen. It's not easy. But there are success stories. Nobody is guaranteeing it here, but we're working on it.

Comment: There were problems in the past with the steam lines.
Response: We are looking at the viability of that distribution system remaining in place as part of the development.

Q: I have a question for Ed - he stated that one of the water storage tanks was in good shape - what about the other three?
A: There are three total; the other two, the powerhouse tank is in fair shape. The problem with the third tank which has the largest volume, is the fire tank, is it's pretty low, it is underutilized.
Q: That's the red and white one?
A: Yes, it's a matter of pumping out there, and the costs associated with that. The tank that is in the best condition is the beige tank, they just painted it last year, did an excellent job of painting, and it's at the highest elevation so you get the biggest bang for your buck out of that tower.

Q: How do you expect DOE to respond to your recommendations?
A: My experience is that this is a road not walked by anyone, the air force, the army, the navy, this is new territory for the Department of Energy. None of these organizations were in business to close down their facilities, so it's unfamiliar turf; everybody is learning as they go. So I can't answer that directly except to say that from our experience they are very engaged in the process, they are listening, they are interested in what we're interested in, we're interested in what they're interested in, and I think the relationship is good. We had a briefing with DOE officials and EG&G officials this afternoon and I think it's a fair statement to say that it is fairly well received in regard to the direction that we are going here. It came to light that we are probably off about 272,000 square feet in terms of what they see as facilities that may not be demolished and what we see as facilities that may be demolished. And 170,000 of that is probably the T-building. The other activities in terms of what direction we're going, we intend to keep very close with the DOE and I think it's a fair statement that it's fairly well received in terms of our reuse plan becoming the framework for the implementation of their exit plan. That's our goal. That's where we want to end up, on the same track. We're very much believers in coming to the table understanding the interests of each of the parties involved in this kind of activity. We have every reason to believe that will be part of the process in this case.

Q: I heard DOE was proposing use of the T-building...
A: On one graphic we indicated that 489,000 square feet that was not in the reuse category and there was a figure of 272,000 that was still up in the air. They're looking at the T-building issue right now. So that's still to be decided.

Q: Have you or will you provide an inventory of all the equipment that's in this facility that's potentially transferable to the private sector?
A: We have looked at the equipment from a technical standpoint to determine market value and make recommendations. If you give us a call, we can provide you with a copy of the list. It's quite comprehensive - there are boxes and boxes in rooms and rooms.

Comment: The facility was supposed to be the most permanent structure in the United States after the war was over. That's where we made the fuses for the atomic bomb.
Response: The T-building is an underground facility with an opening here and here. It has thick walls and ceilings, and was used for production. As I understand it, the strategy is not demolition but to fill and seal - the stuff that's in there (tritium) has relatively short half-life as compared to other materials, so it doesn't seem like an unreasonable strategy from a layperson's standpoint to seal it up and forget it.

Q: It seems to me that you are very strongly analyzing but essentially there will be someone from the outside, some major corporation (as in Canada) to take great advantage of the research facilities. I don't see anyone using this major marketing approach. Why not use a more aggressive marketing approach rather than the conservative solution process? Marketing major domestic and international major big impact to relocate to the site?

A: We do have a proactive marketing approach that has been developed. Unfortunately, to the lay public, it's not obvious all the groundwork that has to be laid in order to get to these facilities and the capabilities that are here. Initially, there was no legislation in place that permitted us to even lease facilities here. At the same time, we are habitating on the site with an existing contractor which is still conducting activities here. So it's not the same as a DOD type of function where the department of defense simply shuts the gates and turns over the base's facilities to the community. In this case, what the CIC is aiming to do is to market from a technological standpoint the capabilities that reside here and they reside in the equipment and the people. Unfortunately in the process, DOE expedited the closing process by 16 months and that closed the window of opportunity on us very quickly regarding the human component. Initially the department was interested in taking equipment from the site and repositioning it within the DOE complex itself, so we're consistently in a struggle with the DOE over those site assets. At the same time, we're trying to get legislation passed to even get to those assets. At the time, the CIC had no organizational structure itself, had no employees, physically did not exist. Ultimately, with regard to the marketing component, what had to be done was to determine what we had there. Understand that this was a super-secret site, and it was almost like trying to market something that was behind closed doors. In fact, EG&G in a very appropriate move, or so it appeared at the time, tried to swing open the doors to the site initially with what they called business and industry days in which they invited hundreds of people to the site; this was the first opportunity for the general public to get a look at the facilities here. That was the first marketing effort taken. It was done to begin to expose the site. Unfortunately, there were no vehicles in place to move on with the service, so we had to go back to the drawing board at that point to create the vehicles to be able to open the site up. Security was another constraint; to get into the site, everyone had to be badged and accompanied by individuals who had gone through security. Many barriers existed to getting onto the site, leave alone go out and proactively market. Unfortunately, the horsepower to deal with all of this culture, this super-secret environment, plowing new ground, is very time-consuming, so marketing was not the number one priority at the time. Even today, we still are habitating with EG&G there. I compare it to two families living in one houses. We're constantly stepping on one another's feet. So it's not as if you can look at the site today and say well there's a million square feet that can be used - there are still about 1200 employees of EG&G that are operating on the site. So only certain capabilities have come out of the system thus far. And we're trying to market those and the capabilities that reside here. The major marketing of the site will take place after the reuse plan is in place, after EG&G and DOE phase out. You can wait a long time for one big investor - the probability of getting one big investor is small. You should make sure you're available to the FedExes, but also need to go after small investors.

Q: It is obvious from the presentation that it will take a major investment to transition the site for reuse. As far as dealing with that issue, the cost, the funding, the responsibilities of the various parties, you said something about the future basis for that?

A: We will begin to understand what those numbers look like, what the alternative strategies are for creating assets and investments. It's not unusual for this type of projects to need an infusion that wasn't anticipated at the first look. Remember that the government is seeking to get out of this as quickly and as cheaply as they can. That's the general goal, and in doing so, they will speak encouragingly about the opportunities this place represents. Our role is to

understand what are the opportunities of this place, and to present this to the community and the CIC for their negotiations with the DOE as this process continues.

Q: Dann mentioned earlier creating a campus-like environment on the site; you also talked about strategies to help blend this into the community. It seems like a fortress now. When will these strategies be generated?

A: At the next stage - the slide that showed the list of potential developments, begin to restructure the entry, begin to open, begin to connect Mound Avenue through, begin to look at how this framework, a road here, maybe there could be a reconnection over to the turnpike, now we can begin to open this place up in a way that it is part of a roadway network, an open space network, begin to function more comfortably as part of a system. The topography mitigates somewhat some of the connections - it's so steep that you're not going to have ease of access.

Q: If you look at the actual transportation on the site, you have basically two roadways that look like little tiny roads; will there be some recommendations as far as timing?

A: We will make recommendations for roadway network with access to the site. Which will depend on what kind of traffic is anticipated on those roads to service this site. We don't want to propose development for which the roadways that service the facility are too narrow.

ADJOURNMENT

Mr. Weithofer thanked the attendees for coming, invited them to attend additional public forums. Meetings will be announced publicly and notices sent.

Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community Improvement Corporation

with

Sasaki Associates, Inc.

URS Consultants, Inc
Economics Research Associates, Inc
Hamilton Rabinovitz & Alschuler
Environmental Technologies, Inc.

Today's Presentation

Due Diligence

- Site Opportunities and Constraints
- Building Reuse Potential
- Development Potential
- Market for Reuse

The Site

- Main Hill
- SM-PP Area
- Test Fire
- Lower Area
- South Parcel

Physical Assets

1. Regional Context
2. Transportation
3. Natural Resources
4. Slopes
5. Soils
6. Areas of Clean-Up
7. Developable Land
8. Reusable Buildings
9. Utilities and Infrastructure

ysical Assets

1. Regional Context

- Proximity to Dayton
- Proximity to Highways
- Miamisburg Community

Physical Assets

2. Transportation

- Mound Chosen for Isolation
- Improved Access Required
- Potential Connections
  - Benner Road
  - SR 892
  - Mound Avenue
  - Cincinnati Pike

Physical Assets

3. Natural Resources

- 100 Year Flood Plain
- Deep Water Aquifer
- Minor Wetlands
- Vegetation

Physical Assets

4. Slopes

- Significant Steep Slope Constraint (42% of the site)

Physical Assets

5. Soils

- Soils Constraining New Development (**79%** of the site)
- Correlates with Steep Slopes
- Construction Premium Costs

Physical Assets

6. Areas of Clean-Up

- Areas of Clean-Up
- Close Coordination of Clean-Up Required

Physical Assets

7. Net Usable Land Area

- Developable Land Area = **159** Acres
- Initial Focus on Parcels with Access

Physical Assets

8. Existing Building Inventory

- **1,346,000** Gross Square Feet

P'ysical Assets

8. Existing Building Inventory

- Office / Administration Space **281,900** gsf
- Lab / R&D / Production Space **898,800** gsf
- Support / Service / Storage **165,800** gsf
- Total Area **1,346,500** gsf

Physical Assets

8. Building Reuse Potential

- Office / Administration Space **252,000** gsf
- Lab / R&D / Production Space **517,000** gsf
- Support / Service / Storage **87,000** gsf
- Total Area **856,000** gsf

Physical Assets

8. Buildings to be Removed

- Gross Square Footage of Buildings with No Reuse Potential **490,000 gsf**

(this includes the 173,000 gsf T Building)

Physical Assets

8. DOE Building Removal Plans

- Gross Square Footage of Buildings with No Reuse Potential **490,000**gsf
- Gross Square Footage of Buildings to be Removed by the DOE **282,200** gsf
- Balance to be Determined **207,800** gsf (including 173,000 gsf in T Building)

Physical Assets

9. Utilities and Infrastructure

- Underground Utilities
- Above Ground Utilities
- Roads, Parking and Sidewalks

Physical Assets

9. Underground Utilities

- Water System
- Sanitary Sewer System
- Storm Sewer System
- Electric Service

Physical Assets

9. Above Ground Utilities

- Stanchion Lines
  - Steam
  - Chilled Water
  - Natural Gas
  - Miscellaneous
- Electric Service

Physical Assets

9. Roads, Parking and Sidewalks

- Roads
- Parking
- Sidewalks

ı rket for Reuse

Due Diligence Summary

- 1,346,500 gsf of Existing Space
  - 281,900 gsf of Office Space
  - 898,800 gsf of R&D Space
  - 165,800 gsf other uses
- 856,100 gsf of Space with Potential for Reuse
  - 252,300 gsf of Office Space
  - 517,300 gsf of R&D Space
  - 86,500 gsf other uses
- Site Utility Premiums
- Market Competition

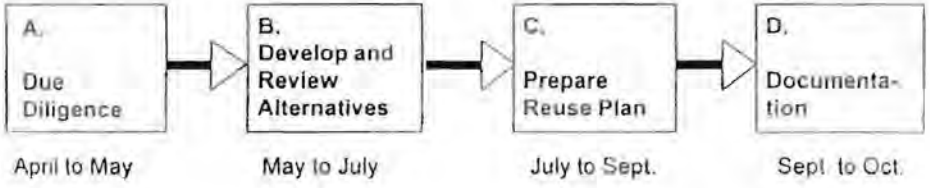
Redevelopment Potential

- South Parcel
- Lower Parking Area
- SM-PP Area

Next Steps

- Prepare Land Use Alternatives
- Refine Market Data
- Develop Financial Feasibility Model

The Planning Process



Miamisburg Mound Comprehensive Reuse Plan

Development Options Summary
Slide Presentation to the Department of Energy
July 23, 1996

Prepared for:
Miamisburg Mound Community
Improvement Corporation

Prepared by:
Sasaki Associates, Inc.

in association with
URS Consultants
Economics Research Associates
Hamilton, Rabinovitz & Alschuler
Environmental Technologies & Communication

Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community Improvement Corporation

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Sasaki Associates, Inc.

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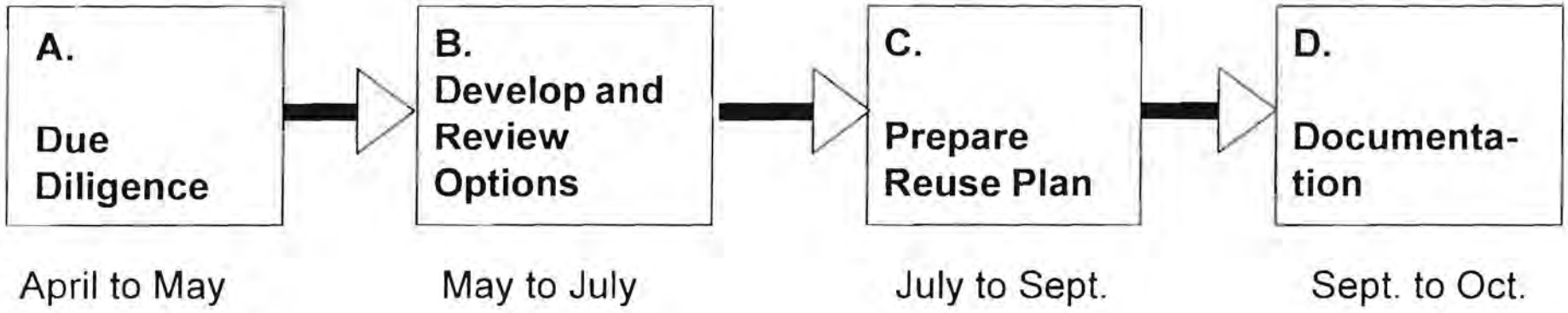
Environmental Technologies, Inc.

Today's Presentation

Review Options

- Goals
- Methodology
- Assets and Liabilities
- Options for Reuse
- Evaluation of Options
- Selection of a Preferred Option

The Planning Process



Physical Assets

1. Regional Context

- Proximity to Dayton
- Proximity to Highways
- Miamisburg Community

The Site

- Main Hill
- SM-PP Area
- Test Fire
- Lower Area
- South Parcel

Goals

1. Community

- Environmentally Clean Site
- Positive Visual and Physical Asset - A Good Neighbor
- Jobs, Salaries and Salary Tax Contribution
- Financially Viable and Self Sufficient Development
- Maximize the Peace Time Return on the Nation's Investment
- An Economic and Technological Asset for the Region

Goals

2. Department of Energy

- Transition the Site's Assets to the Commercial Marketplace
- Eliminate DoE's Environmental Liabilities
- Eliminate DoE's Landlord Responsibilities
- Minimize Clean Up Costs to Tax Payers
- Complete Clean Up and Transition by 2005

Goals

3. MMCIC

- Jobs and Economic Development
- Mitigate the Economic Impact of Closure Upon Employees and Community
- Financially Viable Plan
- Achieve Revenues Sufficient to Complete Transition

Methodology

A View from the Perspective of
Private Development

Methodology

Determination of Assets and Liabilities

- Buildings
- Infrastructure
- Site
- Market

Assets and Liabilities

Buildings

- Reuse 570,000 square feet to 800,000 square feet
- Demolish 550,000 square feet to 780,000 square feet
- Code Compliance

Assets and Liabilities

Planning Assumption:

Buildings are Transferred
in a Code Compliant Condition

Assets and Liabilities

Utilities and Infrastructure

- Water
- Sewer
- Electric
- Storm Water
- Heating
- Cooling

Assets and Liabilities

Planning Assumption:

Utilities are Provided at Rates Competitive with the Market

Assets and Liabilities

Site

- Roads
- Parking
- Landscape Improvements

Assets and Liabilities

Planning Assumption:

Improvements are Made to the Site Including Upgrading Roadways to Local Standards and an Adequate Storm Drainage System

Assets and Liabilities

Site

- Additional Development Potential
- 52 Acres in the South 40
- Infill Potential on 20+ Acres

Assets and Liabilities

Market

- Office / Research and Development
- Industrial / Light Industrial
- Retail / Entertainment
- Residential
- Institutional

Assets and Liabilities

Planning Assumption:

An Economically Viable Development

Assets and Liabilities

Planning Assumption:

Options Seek Opportunities for Potential Cost Avoidance

- Reduced Facility Disposition Costs
- Reduced Surveillance & Maintenance Costs
- Reduced Decontamination and Decommissioning Costs
- Reduced Safe Shutdown Costs

Options for Reuse

Option 1: Industrial Park

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 1: Industrial Park

Building Use

• Office	253,000 s.f.
• General Industry	240,000 s.f.
• Research and Development	150,000 s.f.
• Explosive	140,000 s.f.
• Infrastructure	13,000 s.f.
Total Reuse	**796,000 s.f.**
• New Construction	565,000 s.f.

Options for Reuse

Option 2: Industrial and Technology Center

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 2: Industrial and Technology Center

Building Use

• Office	235,000 s.f.
• General Industry	178,000 s.f.
• Research and Development	150,000 s.f.
• Explosive	131,000 s.f.
• Infrastructure	13,000 s.f.
Total Reuse	**707,000 s.f.**
• New Construction	715,000 s.f.

Options for Reuse

Option 3: Technology Center

- Market
- Development Strategy
- Physical Improvements
- Operation and Maintenance

Options for Reuse

Option 3: Research Park

Building Use

• Office	235,000 s.f.
• General Industry	122,000 s.f.
• Research and Development	138,000 s.f.
• Explosive	70,000 s.f.
• Infrastructure	4,000 s.f.
Total Reuse	**569,000 s.f.**
• New Construction	800,000 s.f.

Evaluation of Options 1

Community

- An environmentally safe closure is assumed.
- While environmentally safe, the lack of investment in amenities will limit the extent to which is will be seen as a physically attractive community asset.
- Salaries and tax contributions are lower than 2 and 3.
- While financially feasible, it is physically less attractive than 2.
- Given the goal of rapid exit by MMCIC and related community involvement, the community is more vulnerable to loss of control over the outcome of the conversion.

DoE

- Less economically attractive than other options.
- DoE's rapid exit goal is threatened.

MMCIC

- Risk to MMCIC will be reduced.
- A quick MMCIC exit will likely reduce the potential value of the transaction to MMCIC and, in turn, DoE.
- Transfer of the property to a private developer will reduce the ability for MMCIC to selectively market the property toward specific ends such as maximization of quality jobs.

Evaluation of Options 2

Community

- An environmentally safe cleanup is assumed.
- Increased investment in site and building improvements, increases the quality of the Mound as a private neighbor.
- Produces the highest number of high paying jobs, over the shortest period of time.
- Maximizes tax revenue.
- Success reduces risk and the potential of additional investment required of the community.

DoE

- Will have potentially less cleanup costs under this option, while enjoying the potential for a more rapid transition to a financially feasible development.

MMCIC

- This is the most financially feasible option.
- Jobs and economic benefits are maximized.
- The feasibility of keeping jobs and providing economic benefit to the community as a first priority is improved.
- There is a need for a successor public/private operator.

Evaluation of Options 3

Community

- An environmentally safe conversion is assumed.
- The most attractive to the community as an asset.
- The highest paying jobs.
- Significantly longer absorption period.
- Reduced potential for financial success.

DoE

- DoE cleanup costs potentially reduced under this option.
- The protracted absorption pace of this option increases the potential for MMCIC failure and the necessity for a continuing role for DoE.

MMCIC

- Not financially feasible because of a limited market.
- Results in a greatly extended time frame for implementation.
- Produces the most high paying jobs.
- Unable to create an "investment grade" property in which private developers will be interested in investing.

Selection of a Preferred Option

- MMCIC and MRC Review of Options
- Public Review and Comment
- Board Review and Selection

Next Steps

- Finalize Land Use Plan
- Coordination with DoE Closure Strategy
- Refine Implementation Strategy

July 1996

CHOICES

FOR

THE FUTURE

Development Options for Mound

A working document prepared in conjunction with the Mound Comprehensive Reuse Plan

This document has been prepared by the Miamisburg Mound Community Improvement Corporation to share with the community and other interested stakeholders information about the important choices being considered for the future of Mound. This publication's goal is to provide a common frame of reference for discussions and decisions leading to those choices -- choices that will become the foundation for the Mound Comprehensive Reuse Plan. The MMCIC's intent is to encourage widespread and well-informed participation in order to arrive at a plan that accurately reflects the community's vision for the tremendous assets of Mound.

Why a Comprehensive Reuse Plan?

The comprehensive reuse plan being created for Mound will guide the continued redevelopment of the site in its transition from a defense weapons research, development and production facility to a privately owned business park. The plan will provide a framework for decisions regarding future business development requests, identify marketing strategies and address physical features of the site, including buildings, utilities, roadways, signage and lighting.

As the lead organization for economic development at the Mound, the Miamisburg Mound Community Improvement Corporation (MMCIC) is spearheading the comprehensive reuse planning process.

The MMCIC is working closely with the Mound Reuse Committee (MRC), an advisory committee of 12 citizens representing various community interests and stakeholder groups. The MRC is the conduit for citizen input regarding future land uses and environmental cleanup standards at Mound.

The MMCIC and the MRC are being assisted in the preparation of the comprehensive reuse plan by a multi-disciplined consulting team led by Sasaki Associates, Inc. of Watertown, Massachusetts.

Evaluating the Choices

The community's vision for Mound is to convert it from a Department of Energy defense weapons production plant into a private, economically viable entity where new employment parallels that lost through the closure of the facility. There are a number of ways to approach that vision, and this document identifies three strategies – or development options – to consider.

An organized and logical approach has been created to assess the merits of each of the three options presented. Fundamental to that approach are the points of view of the community, DOE and the MMCIC. The process is based on measuring the potential of each option against the goals of the three entities identified.

Community goals

- An environmentally clean site.
- A positive community asset physically and visually – a good neighbor.
- Jobs, salaries and income tax contribution.
- A financially viable and self-sufficient development.
- Uses that maximize the nation's peacetime return on public investments.
- An economic and technological asset for the region.

DOE goals

- Transition of facility from defense programs to commercial uses.
- Elimination of DOE environmental liabilities.
- Elimination of landlord responsibilities.
- Lowest possible cleanup costs to taxpayers.
- Completed cleanup and transition by 2005.

MMCIC goals

- Job creation and economic development compensating for the economic impact of the closure upon employees and the community.
- Financially viable plan that balances revenues, absorption pace, investment and operating costs.
- Revenues adequate to complete successful transition.

A Range of Options

As presented here, the development options fall into a continuum. At one end, the development strategy might be to create a conventional light industrial park made up of a number of unrelated businesses. The focus would be on quick disposal and minimal investment in site modifications. At the other end of the development continuum is the technology center, which, like a research park, focuses on attracting high-value, technology-based businesses. The center would present a unified image and require significant site enhancements to achieve that image.

The options presented in this publication describe three discreet points along the continuum. The final selected option could rest at other points along the continuum and even adopt characteristics from any of the other options.

For each development option, the market strategy is described first. This is followed by a description of the development strategy recommended for that market. Next is a listing of physical improvements recommended for the market and the strategy, followed by an operation and management strategy appropriate to the alternative.

REUSE OPTION 1:
Industrial Park

Under this option, capital investments are limited to those necessary to bring the property into compliance with codes, city standards and other legal requirements and to make it economically viable as private real estate. The changes suggested also represent a baseline condition for the physical facilities under all the options. This development strategy will allow the MMCIC to turn over the property most quickly.

Market strategy

- Mound is identified as an industrial park (as opposed to a research and development park). Land and space is available to anyone interested and for all uses allowable under zoning.

- No effort is made to create any special identity or amenity. The focus is on sale or lease to the highest bidder for the use of his/her choice. The only condition is that bidders must take all of a given section of land and/or buildings in accordance with a "disposal" plan. No "cherry picking" is allowed.

- Jobs goals (salary and skill levels) are secondary to finding viable uses and reducing MMCIC time schedule for conversion of the Mound to private use.

Development Strategy

- Opportunities that reduce the time of involvement of MMCIC are sought.

- Investments required to bring the site into compliance with codes and city standards and make it economically viable for private reuse are minimized.

- An outside utility provides sewer, water, and electric services. Heat and cooling is specific to each building or group of buildings.

- MMCIC operates as caretaker until the new owner(s)/operator(s) takes over.

Physical

- Road network improvements are limited to those necessary to bring roads up to city standards.

- Buildings are brought up to an acceptable level for code compliance. Beyond code-based upgrade, all existing buildings are to be used in "as is" condition, unless: a) DOE has designated it for demolition; b) MMCIC has indicated there is no potential for reuse; or c) demolition is necessary to provide parking for existing development areas.

- Each building is given a free-standing boiler and chiller -- or combined systems where most economical – making use of existing internal distribution systems where they are reusable. Sewer, water, and electric services are provided by other entities for a use fee.

- Overhead utility structures are demolished, but the site is not otherwise improved. A utility corridor in the main road is constructed to service sites with gas and electric.

- Site improvements are limited to basic cleanup and upgrade of the storm water management systems to an adequate level.

- Because of the development's industrial park character, no investments in visual amenities such as special landscape, lighting and signage are made.

- Land at the south end of the site is sold in bulk with no improvements. Existing road frontage used for access.

Operation and Management

- O & M costs brought to a level commensurate with competitive private developments.

- Any special features such as common open space areas that would result in management costs are minimized. Focus is on disposition rather than long term management.

- MMCIC remains in business until DOE transfers ownership, at which point, the MMCIC becomes the "auctioneer" to move the property through to another owner(s).

REUSE OPTION 2:
Industrial and Technology Center

This option requires site investments and building improvements to attract a high-value, diversified market and affect rapid-as-possible absorption of buildings and land. It assumes that some public/private developer/operator will stay involved indefinitely to manage the operation in the interest of job creation. This entity's non-profit status would enable the operator to continue receiving federal and state funding.

Market Strategy

- Marketing strategy focuses on attracting the greatest number of jobs, at the highest rates of pay, over the shortest time.

- Available space is marketed to below-market, startup, technology business tenants. Emphasis is on firms dealing with technology-sensitive products, those providing diagnostic and analytical services and others that can take advantage of existing equipment while supporting and complementing existing capabilities. These businesses should be able to work within the physical characteristics of the site and be comfortable with the relatively poor visibility of and accessibility to the site.

- Undeveloped land is marketed to technology-based or light-industrial users with no specific effort to achieve affinity with existing startup businesses on site.

- To increase its value, vacant land is marketed after it is demonstrated that existing Mound facilities can be successfully transferred to the private sector.

Development Strategy

- Investments in infrastructure and amenities go beyond code compliance, but only to the extent necessary to attract the desired market, at the desired rate of absorption.

- A broad mix of R&D, flex space, light manufacturing, and office users are sought to accelerate absorption of land and buildings and minimize the closure impact on the community.

- Amenities on the site are created, possibly including support retail, food service, banking, gas, dry cleaning, recreation, and day care, among others.

- MMCIC operates the site through the planning and transfer stages, setting up an administrative entity to provide for long-term operation of the physical plant. Responsibilities are likely to include leasing; building, road and open-space maintenance; central shipping and receiving for main development areas; and operation of the utility systems if public operation is not feasible.

- Undeveloped land is sold for development by others.

Physical

- Maximum reuse of existing roadways is emphasized, with selected upgrading to achieve a more marketable standard.

- A common space is established – probably within in an existing building – where clerical, duplication and other services, as well as conference rooms, can be provided to startup businesses.

- Existing buildings are reused unless: a) demolition is necessary for parking; b) the feasibility of finding a user is limited because the building is too specialized; or c) the reconfiguration of the building for a potential user is not feasible.

- All retained buildings rely on their own heating and chiller systems, except where connected buildings suggest the economy of a combined system.

- Water, sewer, electric and gas services to individual buildings are provided by outside operators.

- Investments are made in some limited amenity development around buildings, including small open spaces, improved lighting, paving and landscaping.

- Existing open space is cleaned up on a limited basis to improve appearance.

- The storm water management system – including retention areas – are expanded.

- Parking facilities are well located and improved with paving, lighting and limited landscaping.

- Raw land is sold or leased in bulk, and Mound Avenue is extended to improve access to the raw land.

Operation and Management

- A public/private operator succeeds MMCIC and remains the key player in the ongoing management of Mound properties. Raw land can be sold, but the existing facilities – marketed below rate – would be leased with a primary goal of job creation. As a publicly supported body, the public/private successor to MMCIC can operate at no profit, or be a conduit for federal and state funding while managing the asset to maximize job creation. A joint venture (for fee) may be a way of bringing management expertise to the project, but the 'break even" goal will preclude a for-profit partner.

- All site amenities and services provided by the operator are evaluated on a cost/benefit basis and provided to MATC businesses at no less than cost.

REUSE OPTION 3:
Technology Center

This is the "high-investment" option focused more exclusively on the technology market. Infrastructure and other improvements are made to bring the property to a level attractive to investors and the higher-value market segment. MMCIC could remain an operator or a partner with a investor/operator, or could sell the property to an investor/operator.

Market Strategy:

- Focus is on highest paying jobs, potentially increasing the length of time over which the space can be absorbed.
- The historical advanced technology character of the site is promoted and emphasis on the core technologies is continued.
- The effort is made to attract firms specializing in technology-based products, diagnostics and analytical services, complementing the existing capabilities of the site.
- On-site retail and commercial services are provided.
- The MATC seeks to be competitive with other projects of a similar market profile in the Dayton-Cincinnati area.

Development Strategy

- The development strategy is long term.
- The strategy is focused on a high-value market segment that supports regional economic development efforts.
- Mound is developed as an "investment-grade" property.
- The image of an advanced technology center is created by modifying, improving or replacing facilities and infrastructure through long-term investment.

- MMCIC continues to operate the center until it reaches an agreement with DOE that satisfactorily provides for the transfer of an asset which is financially sound and competitive in the technology market. At that point, MMCIC can identify a real estate manager/ developer who eventually will become owner/developer.

Physical

- Technology center is campus-like in character. Landscaped open space are part of each development zone.

- Only quality buildings with reuse potential for office, R&D, technology manufacturing are kept - consistent with the image of higher-market-value special technologies.

- All buildings have their own boilers and chillers. Budget for office and R&D users' leasehold improvements goes beyond code compliance and is focused on investments necessary to attract higher-value uses.

- New roads are built to provide access to the main development portion of the site and connect Mound Avenue to Benner Road. All roads are upgraded in width and quality. Street trees in selected locations and parking with landscape improvements are included.

- Existing open space is improved, with clearing and replanting where necessary.

- Raw land is developed with roads and infrastructure to create 5- to 10-acre individual sites for lease or sale.

- Design guidelines are established to provide standards for building coverage, open space, landscape, building placement and general architecture.

Operation and Management

- Because the technology center is an investment-grade option, the assumption is that, in the relatively short term, a developer would be interested in acquiring the property. MMCIC may choose whether it will participate as part of a joint venture to operate and own the property. Through the leasing and development stage, the MMCIC would select, through a competitive process, a partner and phase out its own participation in the project. The strategy is to seek a university, industry or developer to purchase and/or assume property ownership.

- Cost-effective site services, beneficial to MATC businesses, are organized and provided.

- The main development portion of the site is operated as a single-owner property, as are the other groupings of buildings that cannot be economically subdivided because of access, lot size, parking and other site features.

- The open space is developed to a condition where individual lots can be leased or sold.

THE NEXT STEP

These development options for Mound will be evaluated based on public comments, market and financial feasibility, fiscal and environmental impacts and quality-of-life considerations. This analysis will result in the selection of a preferred option, which then will be detailed in a site plan and implementation program. The detailed plan will be presented for the review and comment by the community and other stakeholders in a public meeting in October.

For more information, contact:

Miamisburg Mound Community Improvement Corporation

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Miamisburg, Ohio 45343-0232

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Located within the Mound Advanced Technology Center.

Mound Advanced Technology Center

A Reuse Strategy for the Miamisburg Mound

Miamisburg Mound Community
Improvement Corporation

with
Sasaki Associates, Inc.

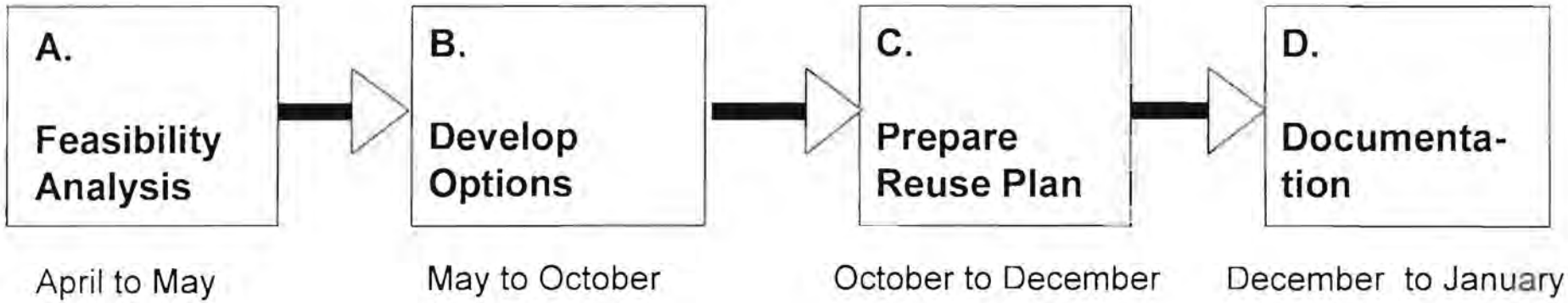
URS Consultants, Inc.
Economics Research Associates, Inc
Hamilton Rabinovitz & Alschuler
Environmental Technologies, Inc

Today's Presentation

Recommended Reuse Plan Presentation

- Goals
- Methodology
- Assets and Liabilities
- Options
- Proposed Reuse Plan
- Next Steps

The Planning Process



Goals

Shared

- Environmentally Clean Site
- Successful Transition of the Mound to a Private Research and Industrial Park

Goals

Individual

Community

- Jobs, Salaries and Salary Tax Contribution
- An Economic and Technological Asset for the Region
- Positive Visual and Physical Asset "A Good Neighbor

MMCIC

- Jobs and Economic Development
- Mitigate the Economic Impact of Closure Upon Employees and Community
- Financially Viable Plan
- Achieve Revenues Sufficient to Complete Transition

DOE

- Eliminate DOE's Landlord Responsibilities
- Minimize Clean Up Costs to Taxpayers
- Complete Clean Up and Transition by 2005

The Place

- A Distinguished History
- A Promising Future
  - Building Condition
  - Access and Parking
  - Operating Costs

The Vision

- Contemporary Research and Industrial Park
- Buildings Improved to a Marketable Condition
- Site and Infrastructure Improved to Support Buildings and their Tenants
- Sites for Future Development

Methodology

A View from the Perspective of
Private Development

Methodology

Determination of Assets and Liabilities

- Market
- Buildings
- Site
- Infrastructure

Decision Making

- Public Meetings
- DOE & MMCIC Work Sessions
- Land Use Committee Negotiations
- MMCIC & MRC Work Sessions

Assets and Liabilities

Land Use

- Main Hill
- SMPP
- Test Fire
- Lower Area "A"
- South Parcel

Assets and Liabilities

Land Use

- Total Land Area - 306 Acres
- Developable Area - 155 Acres

Assets and Liabilities

Building Use

Issues:

- Existing Square Footage - 1,300,000
- Reusable Square Footage - 600,000 to 800,000

Assumptions for the Plan:

- Buildings are improved to a code compliant/marketable condition

Assets and Liabilities

Circulation and Parking

Issues:

- Roads Below Standard
- Parking Poorly Located

Assumptions for the Plan:

- Upgrade Roads to Local Standards
- Relocate Parking to Serve Buildings

Assets and Liabilities

Infrastructure

- Water
- Sewer
- Electric
- Storm Water
- Heating
- Cooling

Assumptions for the Plan:

- Water, Sewer, Gas and Electricity are Provided by Local Utility
- Heating and Cooling are Decentralized

Options for Reuse

Total Clearance of Site

- Remove All Buildings and Infrastructure
- Revise Future Use to Open Space and/or Residential

Cost - an additional $750 to $1,200 Million

Findings - Job loss and substantially more costly

Assets and Liabilities

Market Potential

- Office
- Research and Development
- Industrial

Assumptions for the Plan:

- An Economically Viable Development

Assets and Liabilities

Market Potential

Annual Market Absorption

• Office	25,000 Net S.F.
• Research and Development	25,000 Net S.F.
• Industrial	50,000 Net S.F.

Options for Reuse

Purchase by a Single User

- Revise Market Strategy to Seek a Single Tenant or Buyer

Cost - Savings Potential of 15 percent

Findings - Probability of Occurring is 5 percent

Options for Reuse

Mixed Use Research and Industrial Park

Building Use

• Office	229,900 S.F.
• General Industry	180,300 S.F.
• Research and Development	150,300 S.F.
• Explosives	134,100 S.F.

Cost - Requires a $50 Million Investment in Improvements

Findings - Success Requires Improvements to be Completed Prior to Transfer.

Proposed Reuse Plan

A Strategy for Joint MMCIC and DOE Plan for Clean Up, Improvement, and Economically Viable Reuse

Proposed Reuse Plan

The Market

Responding to a Regional Market for Low Rent Research, Industrial and Office Space

Proposed Reuse Plan

The Market

Projected Annual Absorption

• Research and Development	25,000 Net S.F.
• Industrial	50,000 Net S.F.
• Office	25,000 Net S.F.

Proposed Reuse Plan

Land Use

Parcels	Name	Use	Building Reuse Area	Potential New Bldg. Area
A	Building 61	General Industrial	47,700 s.f.	-0-
B	Lower Parking Area	Research and Dev.	-0-	200,000 s.f.
C	Main Hill (*front*)	Office, R&D, Gen. Industry	436,700 s.f.	100,000 s.f.
D	Lower Area "A"	R&D, General Industrial	9,100 s.f.	40,000 s.f.
E	Test Fire	Explosives	96,700 s.f.	-0-
F	Bldgs 100 and 105	Office & Gen. Industrial	31,900 s.f.	60,000 s.f.
G	Overlook	General Industrial	6.300 s.f.	150,000 s.f.
H	Lower Area "B"	Infrastructure	12,600 s.f.	-0-
I	Main Hill (*back*)	Explosives	66,200 s.f.	-0-
J	"South 40"	General Industrial	-0-	290,000 s.f.
TOTAL			**707,200 s.f.**	**840,000 s.f.**

Proposed Reuse Plan

Land Use

Use	Number of Buildings	Square Feet
Office	6	229,000
Research and Development	8	150,300
Industrial	9	180,300
Explosives	14	134,100
Infrastructure	10	12,600
Total		**707,200**
Additional Development Potential		**840,000 S.F.**

Proposed Reuse Plan

Circulation and Parking

A Spine Road Accessing All Parcels

Roads which Meet Community Design Standards

Parking in Proximity to Buildings

Proposed Reuse Plan

Open Space

Permanent Protection of Open Space

Reforestation of Steep Hillsides

Campus Landscape Environment

Next Steps

- An Ongoing Long Term Process
- A Joint MMCIC/DOE Plan
- Closing the Financial "Gap"

Next Steps

- Monitor Critical Success Factors

- Clean Up Schedule
- Facility Improvement Completion
- Rate of Absorption
- Rent Levels
- Operating Cost

Next Steps

- Confirm Public Support
- MMCIC and MRC Review and Approval
- Final Plan Documentation
- Ongoing MMCIC Work with DOE to Achieve Joint ICP/Reuse Plan

Miamisburg Mound Reuse Plan

Vision Plan

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

Legend

- Surface Water/Wetlands
- Lawn /Old Fields
- Trees
- Existing Mound Buildings
- Proposed Mound Buildings
- Paved Surfaces
- Aquifer

December 1996

N

0 375 750

Miamisburg Mound Reuse Plan

Transition Plan

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

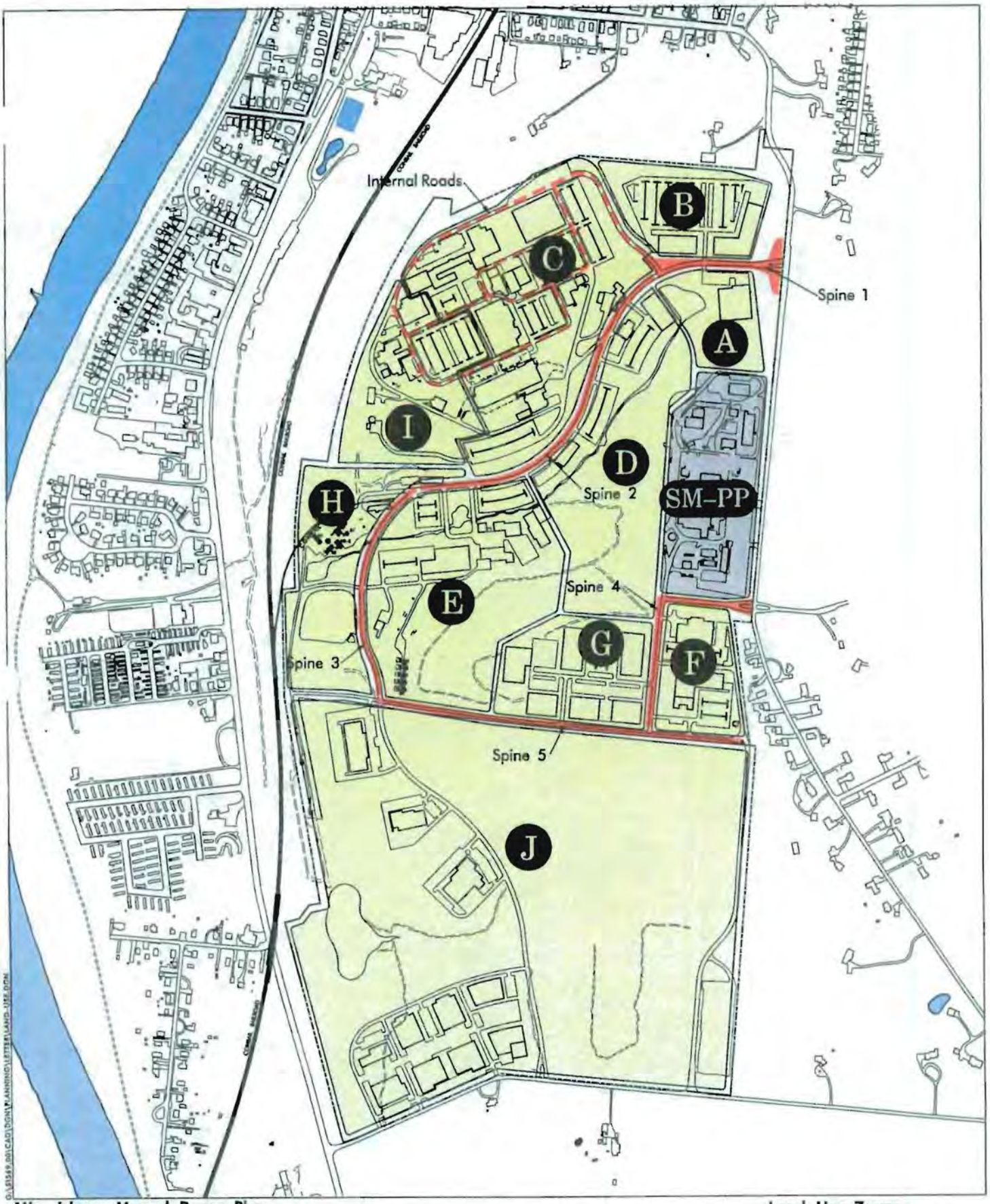
Legend

- Surface Water/Wetlands
- Lawn/Old Fields
- Trees
- Existing Mound Buildings
- Paved Surfaces
- Aquifer

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Land Use Zones

MIAMISBURG Mound COMMUNITY IMPROVEMENT GROUP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

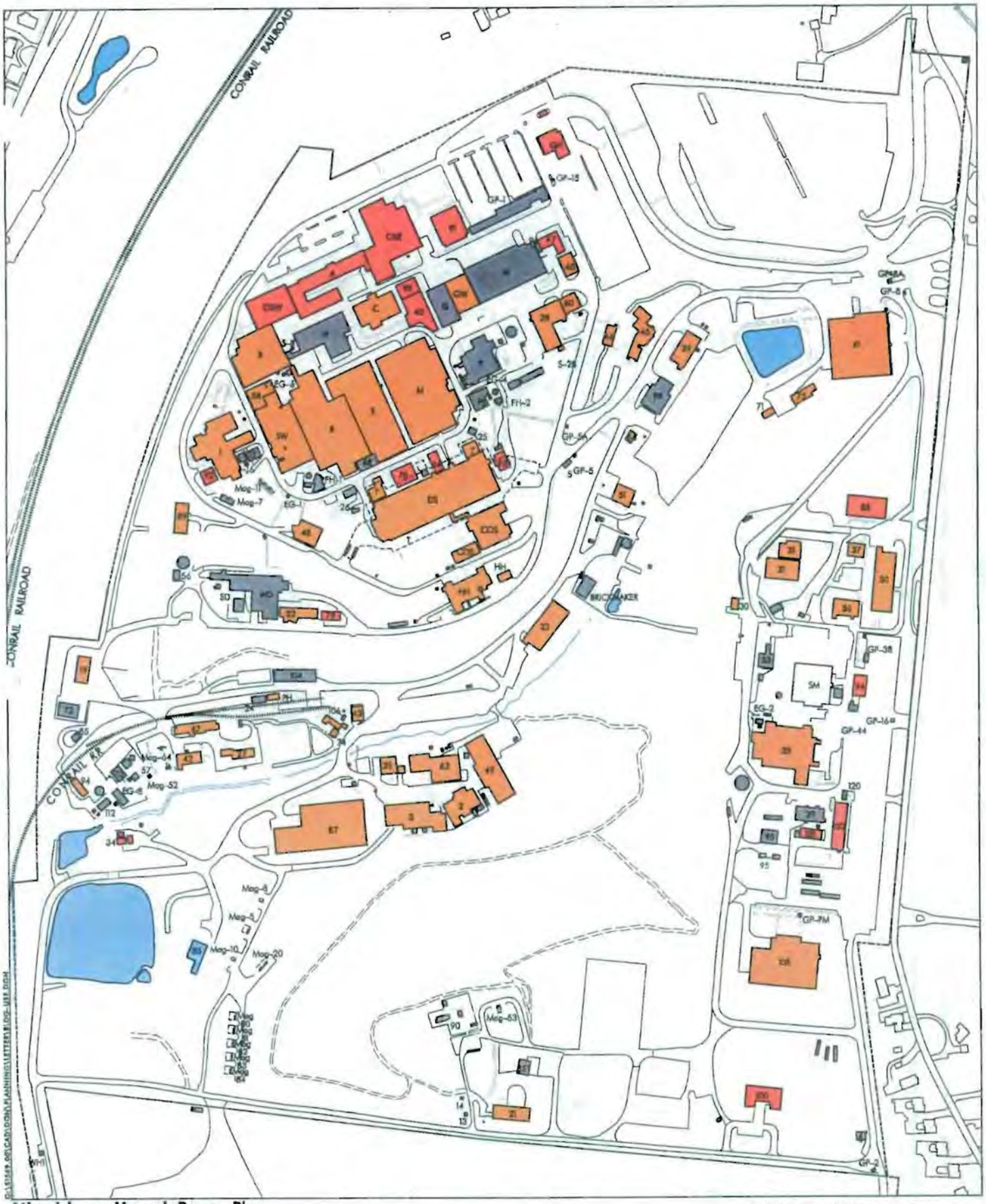
Legend

- Parcels
- Spine Roads
- Internal Roads

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Existing Building Use

Miamisburg Mound Community Improvement Corp.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

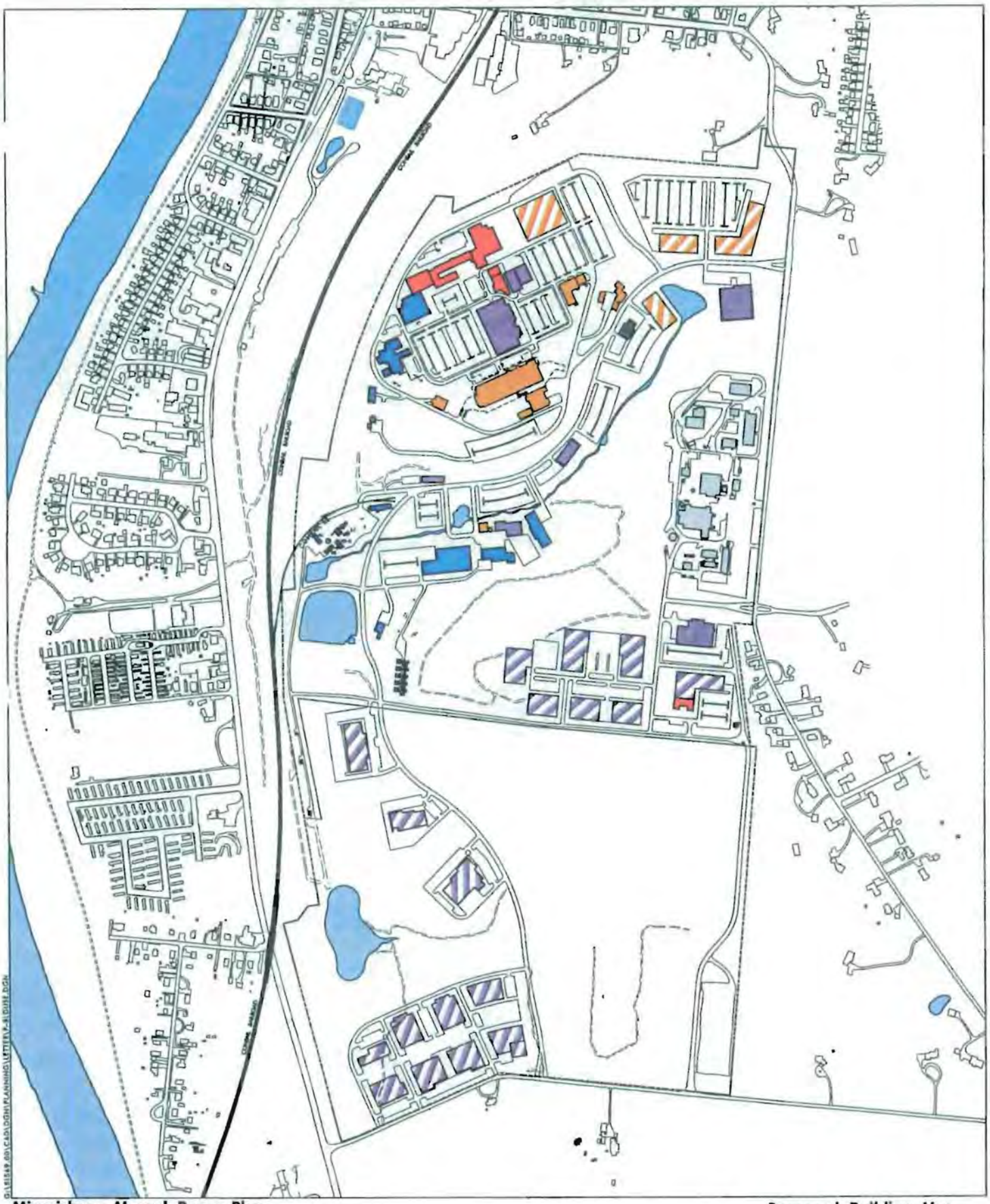
Legend

- Lab /R&D /Lt. Industrial 930,640 GSF
- Office /Administration 281,900 GSF
- Storage /Support/Service 132,160 GSF

December 1996

N

0 200 400



Miamisburg Mound Reuse Plan

Proposed Building Use

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

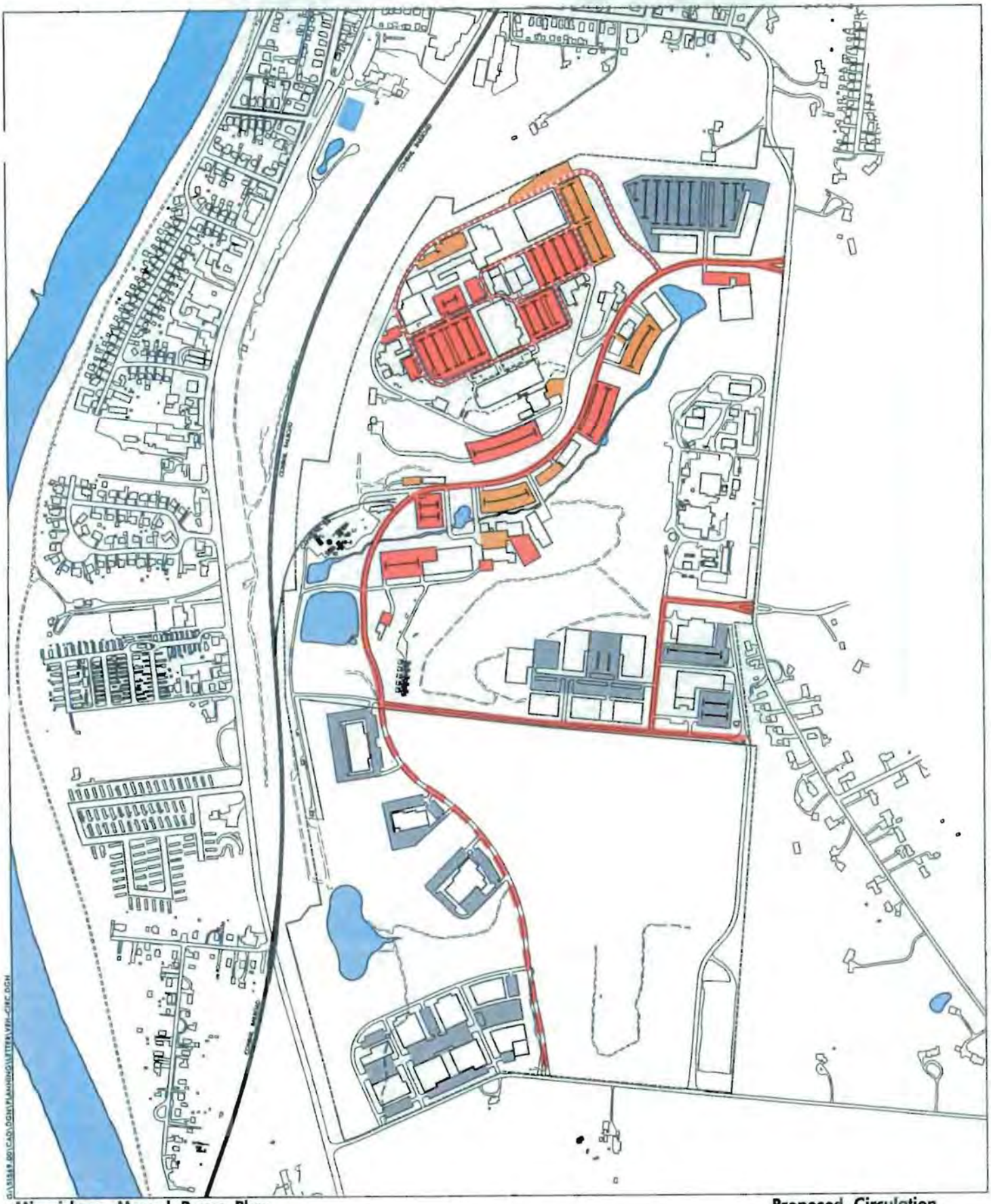
Legend

Buildings to be Reused	Potential New Buildings	
		Office
		R & D
		Explosive
		General Industry
		Infrastructure
		SMPP

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Proposed Circulation & Parking

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

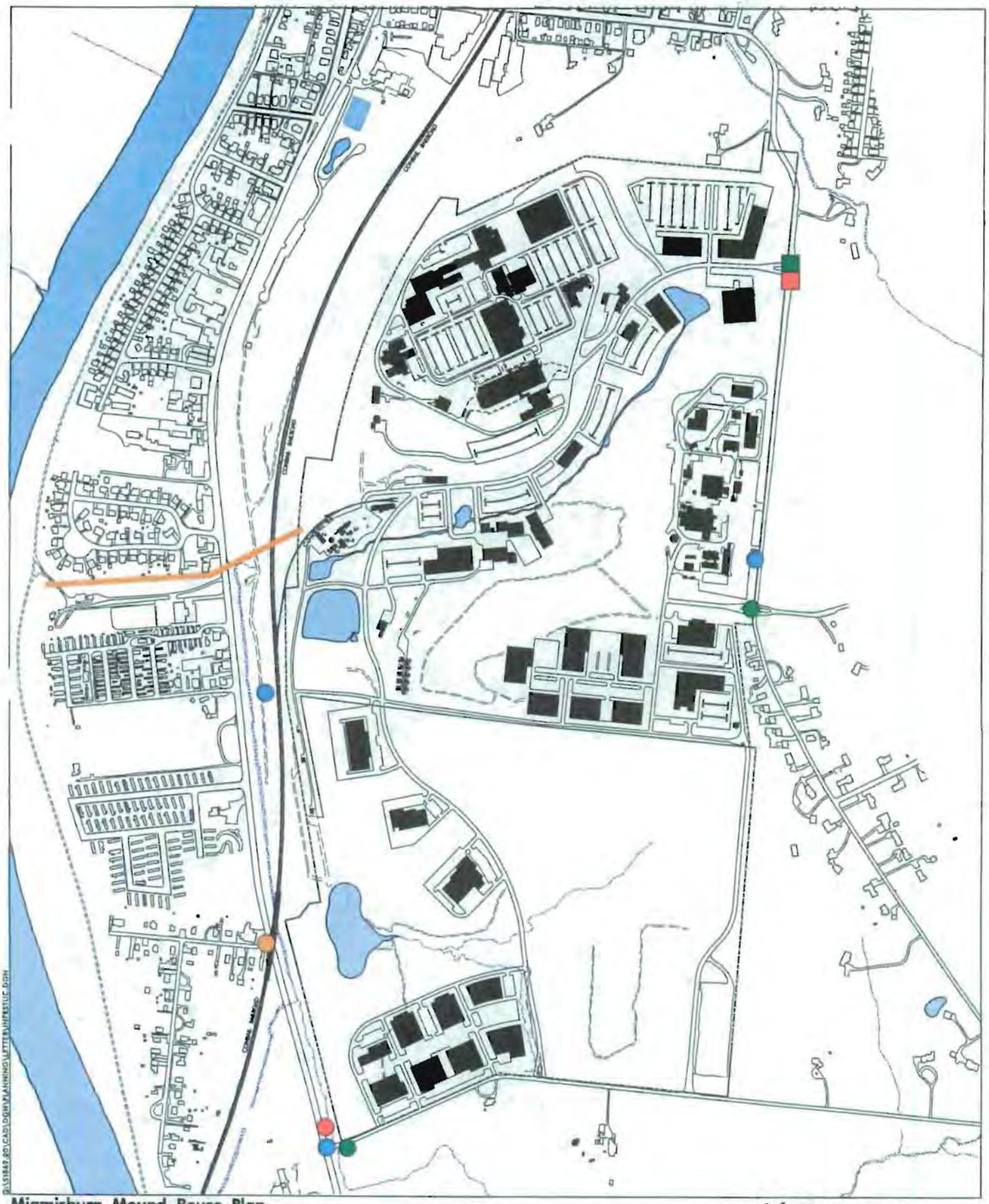
Legend

- Existing Parking
- Proposed Parking (Reuse Plan)
- Proposed Parking (By Others)
- Spine Road (Reuse Plan)
- Spine Road (By Others)
- Internal Roadways

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Infrastructure

MIAMISBURG Mound COMMUNITY IMPROVEMENT GROUP

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Rabinovitz & Alschuler
Environmental Technologies and Communications, Inc.

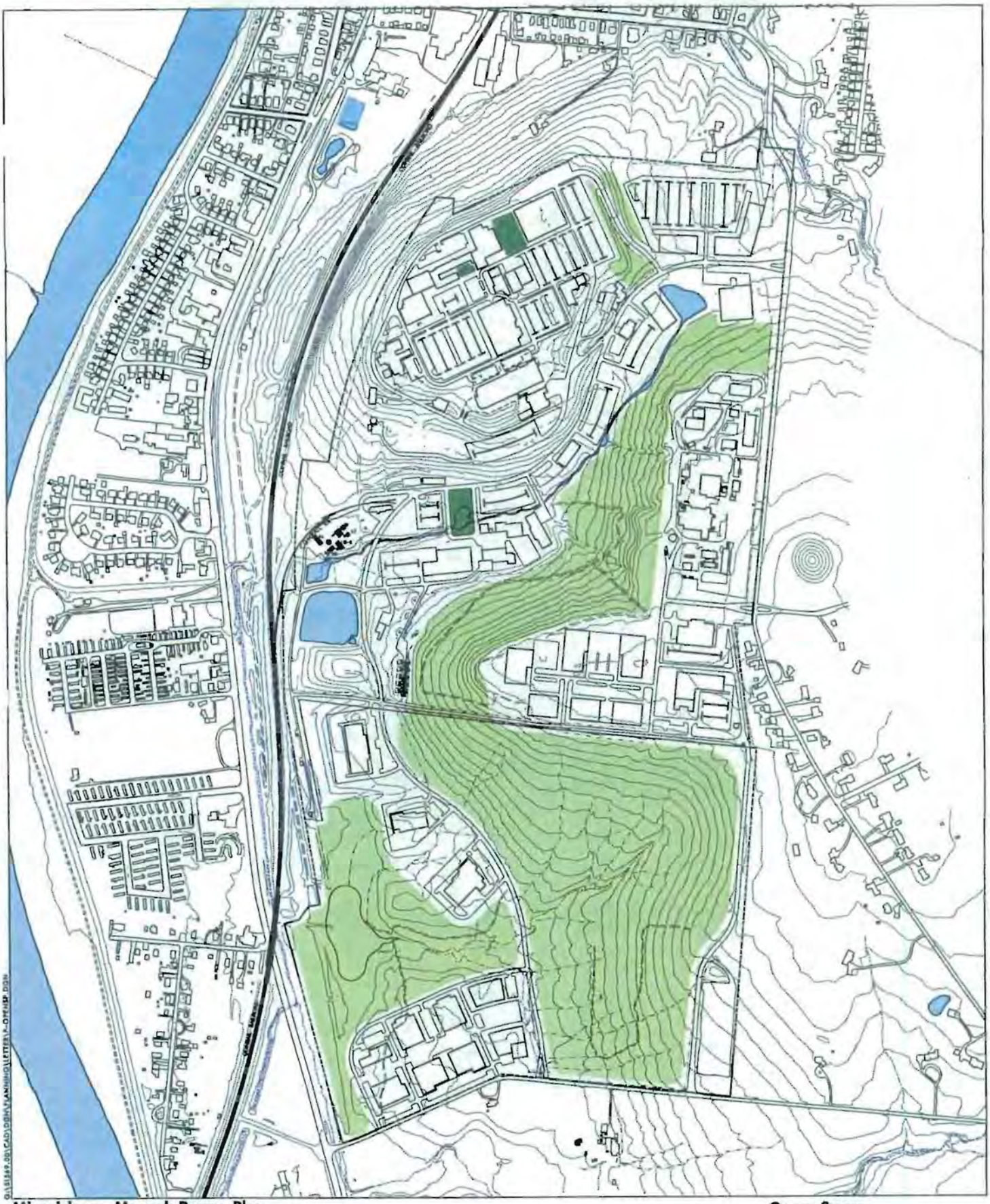
Legend

Existing Connection	Proposed Connection	
		Natural Gas
		Sanitary Sewer
		Electrical Supply
		Water Supply
		Existing Sewer Outfall from Treatment Plant

December 1996

N

0 375 750



Miamisburg Mound Reuse Plan

Open Space

Legend

- Natural
- Courtyards

December 1996

0 375 750

N

MIAMISBURG Mound COMMUNITY IMPROVEMENT CORP.

SASAKI

URS Consultants, Inc.
Economic Research Associates, Inc.
Hamilton, Robinovitz & Alschuler
Environmental Technologies and Communications, Inc.

MIAMISBURG MOUND COMPREHENSIVE REUSE PLAN
ADDENDUM
August 1999

Overview

The Miamisburg Mound Comprehensive Reuse Plan (CRP) was adopted by the community in 1997 to guide the redevelopment of the Mound Facility from a former nuclear weapons component research and production facility to a privately owned research and technology industrial park. During the intervening time period to the present, three activities related to the site have resulted in refinements to the Plan. These activities include the following:

- Completion of the Preliminary Engineering for site infrastructure improvements.
- Rebaselining of cleanup activities by the US Department of Energy's site contractor, Babcock and Wilcox of Ohio.
- Completion of the Final Engineering for the East Boundary Improvement Project.

While the Goals and Objectives of the Plan remain the same, refinements have been made in the roadway layout and buildings to be retained and demolished as a result of the activities noted.

Reuse Plan Refinements

Refinements to the Miamisburg Mound Comprehensive Reuse Plan (CRP) contained in this **Addendum** to the CRP consist of two types. First there are adjustments to the road alignments from those illustrated in the CRP. The second type of refinement to the CRP consists of the conceptual configuration of buildings including buildings to remain onsite, buildings to be demolished and the location of new buildings. The refinements to road alignments and building configurations are shown on the accompanying map of the Vision Plan dated August 1999.

Road Alignment Refinements

Adjustments to road alignments from the CRP include the Spine Road, Mound Road, Cul-de-sac Road and the Main Hill Access & Loop Roads. The refinements to the road system serving the site were made to further integrate access to existing and proposed buildings and to enhance the ingress and egress locations of the site. The following describes the adjustments made to the road system.

Spine Road

The location of the Spine Road which is the principal thoroughfare passing through the site and connecting the site to the larger Miamisburg area was adjusted to change its alignment internal to the site and at its intersections with exiting public streets. The intersection of the Spine Road with Mound Road has been moved to the north to accommodate the realignment of Mound Road as part of the East Boundary Improvement Project. This change also accommodates additional development along Mound Road North of Building 61.

At the southern end of the Spine Road, access to the site has been change from Benner Road to Dayton – Cincinnati Road (Old US 25). This change will provide a direct access to the site from a major thoroughfare and provide a more direct access to the proposed SR 892 beltway connection to Interstate 75 and 70.

The location of the Spine Road internal to the site was changed to follow an alignment that takes the road north across the location of an existing pond that will be filled; then east of the existing fire station parking lot and east of Building 22; then north and west of the Test Fire Area and then south and west to intersect with Dayton – Cincinnati Road. This alignment will improve access to existing building locations and proposed development sites and provides for traffic circulation through the site.

Mound Road

Mound Road adjacent to the site has been incorporated into the CRP because of the strategic importance of the road in providing access to the eastern portion of the site. Extensive improvements are being made to Mound Road as part of the East Boundary Improvement Project. Mound Road will be widened to three lanes with curbs, sidewalks, storm sewers and streetlights. The upgrading of Mound Road will improve access to the site and enhance direct access to existing and proposed buildings planned for the eastern portion of the site.

Cul-de-sac Road

The location and configuration of the new Cul-de-sac Road extending off of Mound Road has been refined from the CRP to provide for the expansion of the MATC businesses located in the area. The Cul-de-sac Road is part of the East Boundary Improvement Project and will include the construction of a new road with curbs, sidewalks, storm sewers and streetlights. The configuration of the Cul-de-sac will improve access to existing businesses and provide for access to proposed building sites.

Main Hill Access & Loop Roads

The configuration of the road system on the Main Hill portion of the site has been modified to provide a second direct connection to the Spine Road. The revised layout will result in a looped system that will provide a more integrated roadway network tying

the Main Hill access not only to the northern portion of the site, but also to access from the south. The concept envisions the extension of the Main Hill Access Road to the south to tie into the Spine Road on the west side of the site. A secondary Main Hill looped system would be created by connecting the extended Main Hill Access Road with the existing roadway system that passes by COS Building and extends up the hill in a north westerly direction to tie back into the Main Hill Access Road. The revised configuration from the CRP will improve access to the main Hill and provide for direct access to existing and proposed buildings.

Building Configurations

Adjustments to the building configurations from the CRP included buildings to remain on site, buildings to be demolished and the location of new buildings. The areas of the site where modifications to building configurations were made include the Main Entry, Main Hill, SM-PP, Test Fire and South Property areas. The adjustments were made to capitalize on the potential development sites created by roadway realignments, utilize some existing buildings on an interim basis, demolish buildings with high renovation costs and provide facilities that reflect anticipated market demand. The following describes the adjustments made to building configurations by area of the site.

Main Entry Area

Modifications were made to the building configuration in the Main Entry area adjacent to Building 61 in order to provide a prominent location for a new building. The new building is envisioned to be a two to four story signature building designed to fit the topography of the new Main Entry location. The building configuration to the west of the Main Entry where the main parking lot for the site is currently located has also been modified to reflect the new entry. The design of the proposed building for this site is anticipated to be the same as that of the Main Entry building.

Main Hill Area

The modifications to the building configurations in the Main Hill Area from the CRP consist of retaining certain buildings previously indicated as being demolished, demolishing certain building previously indicated as being retained and adjustment to the location of new buildings. The following describes the modified building configurations.

Buildings Retained

Buildings being retained that were indicated in the CRP as being demolished include GH, GP-1, GW and W. These buildings are located in the northwest potion of the Main Hill Area and were determined to be of leaseable value, at least in the near term. The CRP called for these buildings to be demolished and a new building with parking to be built in this area

Buildings To Be Demolished

Buildings M, I, B and 89 were indicated as being retained in the CRP. These buildings are now being indicated as being demolished based on the cost of rehabilitating the buildings and their leaseability. Buildings M and B are areas where additional parking will be provided. Building I is an area where a new building is proposed. Building 89 will likely remain for storage but will be removed and the area will be made part of the open space system for the site.

Location of New Buildings

As noted, the area where Building I is currently located will be the location of a new building. The development scheme would have the new building serve as the western anchor to the development of a courtyard with parking located in the courtyard area. The building proposed in the CRP for the northwest portion of the Main Hill Area may be worth considering for redevelopment over the long term after Buildings GH, GP-1, GW and W have outlived their useful life.

SM-PP Area

The SM-PP Area of the site fronting on Mound Road was not part of the CRP. This area has been added to the plan in recognition that the RTG program will remain on site. While the program will continue to operate in existing buildings in the near future, a building configuration for new buildings has been added to the plan to accommodate future development.

Test Fire Area

The building configuration in the Test Fire Area has been modified to eliminate Building 67. The building was changed from retain to demolish because of its location relative to the realigned Spine Road.

South Property Area

The building configuration of new buildings in the South Property Area was modified to reflect the realignment of the Spine Road.

CRP & Addendum Cost Comparison

Costs to implement the revised reuse plan contained in the Addendum were studied for site and building related improvements. Cost estimates were developed for the improvements reflected in the revised reuse plan and a comparison was prepared between the CRP and the Addendum to the Plan. The results of the cost comparison are shown on Attachment A. The estimated cost for improvements contained in the Addendum to the reuse plan are $42.7 million compared to an estimated cost of $48.3 million or the initial CRP.

Summary

The Reuse Plan Refinements dealing with the roadway adjustments and building configurations described in this Addendum to the CRP and including the map illustrating the changes represent the evolution of the plan. As noted in the introduction, this modification to the CRP is based on knowledge obtained from the completion of the site preliminary engineering study, rebaseline of cleanup activities and information from final engineering for the East Boundary Improvement Project. The objective of the reuse plan to create a privately owned industrial technology park remains the same.

CRP ADDENDUM - ATTACHMENT A

SASAKI COMPARISON CRP & ADDENDUM AUGUST 1999

ITEM	*Sasaki Cost*	*Addendum Cost*
Site Related Costs		
Water/Waste water	1,289,063	1,289,063
Gas/Electric	2,968,750	2,968,750
Stormwater Sewer/Detention	2,554,687	2,554,687
Road Improvements	1,720,313	5,799,758
Road Lighting	362,500	362,500
Parking	1,415,625	1,415,625
Parking/Site Lighting	623,437	623,437
Stanchion Lines/Fence Removal	625,000	625,000
Formal Landscape Areas	1,981,250	1,981,250
Natural Landscape Areas	2,148,437	2,148,237
Subtotal	**15,689,062**	**19,768,307**
Building Related Costs		
Cost to Bring Buildings Up to Code	11,790,625	11,335,775
Plumbing/Electrical Upgrades	525,000	642,170
HVAC Improvements	8,918,750	5,906,347
Deferred Maintenance	5,312,500	4,485,400
Building Demolition	1,885,937	3,042,937
Subtotal	**28,432,812**	**25,412,629**
Tenant Improvements	$4,173,000	4,411,380
TOTAL COSTS	**$48,294,874**	**49,592,316**

MAIMISBURG MOUND COMPREHENSIVE REUSE PLAN
ADDENDUM
SEPTEMBER 2001

Overview

The Miamisburg Mound Comprehensive Reuse Plan (CRP) was adopted by the community in 1997 to guide the re redevelopment of the Mound Facility from a former nuclear weapon component research and production facility to a private owned research and technology industrial park. In August 1999, The CRP was revised to include Roadway Alignment Refinements, adjustments to the building configuration and associated updates to the costs. Since August 1999, the following activities have occurred that impact the CRP. These activities include:

- Completion of the East Boundary Improvement Project
- Completion of the Engineering Design and Construction of the Upper Hill Project
- Completion of the Engineering Design for the South Spine Road Project
- Completion of the Engineering Study for the routing options for the Communications Duct-Bank System
- Completion of Water Studies by the City of Miamisburg and MMCIC, which recommended needed improvements both on-site and off-site for incorporation of the site water system into the municipal water service.

While the basic Goals and Objectives of the Plan remain the same, refinements to the plan have been made based on the above studies and projects.

Reuse Plan Refinements

Refinements to the CRP contained in this **Addendum** consist of three types. First there is the addition of the communication duct-bank and the second is the revisions to the water supply system based upon the two water studies that we conducted. The final adjustments in this addendum were based on evaluations of existing facilities and updating the costs associated with activities to get the facilities up to building code requirements. The modifications for the communication duct-bank and the water system are shown on the accompanying maps.

Communications Duct-Bank

During the past year, it has become clear that in order for the further development and marketability of the site, MMCIC must exploit the existing communication system on and around the site and prepare current and future buildings for high-speed communications. To meet this end, an engineering study was conducted to determine

where communications duct-banks should be located, how many ducts were needed and how they would connect with the existing systems on site. This study also included a cost estimate for completion of this work. These cost are based on site estimates received from General Contractors from the Upper Hill Project, the South Spine Road Project and the engineering firm that conducted the evaluation. The communication duct-bank system will be a looped system to provide for reliability and redundancy on the site. An access junction manhole is located along Mound Road, South of the Main Entrance and at the intersection of Vanguard Boulevard (Spine Road) and Dayton-Cincinnati Pike. This will also allow the service providers to provide sonnet-ring service to the site. Based upon our installation of these conduits, MMCIC will be able to provide multiple communication options to future clients while at the same time, recovering the cost of the installation of the conduits. This will either be via teaming arrangements or leasing of the duct-bank system. It is felt that this will give the Mound Advance Technology Center (MATC) a marketing advantage.

Water Supply System

The assumptions in the original Sasaki plan were:

- The existing SM/PP water tower would continue to be used and connected to the City's water distribution system.
- A new water line would be added to serve the south end of the site and connected to the existing 12-inch water main
- The Mound water wells could be used to provide water for fire protection. The pumps and storage tank for fire protection would be maintained.

Based upon a more detailed evaluation of the water system, the assumptions have changed due to flaws in these assumptions. The SM/PP tower could not be effectively tied into the city's water distribution system. They are at different elevations. In addition, in viewing the types of piping on site, we have found that a lot of the piping has reached its useful life, having been installed in the 1940's, and is beginning to leak and deteriorate.

The 12-inch main on the South end of the site is part of the City's low-pressure system. Based upon the water study conducted, in order to meet the necessary fire flow requirements a looped system is needed in order for MMCIC to develop the site.

The assumption that the existing Mound pumps and storage tank could be maintained has also proven to be a problem. The existing ground storage tank is in need of major repairs and would cost several thousand dollars to repair or replace. If the existing fire system were retained, it would have to be operated and maintained by MMCIC, which would add signification costs to operations of the site. These costs would have to be passed on to the tenants, which would have a negative impact on lease rates and redevelopment of the site.

The City of Miamisburg conducted an Engineering study to determine options and needed improvements that would be needed to meet the water (both domestic and fire flows) needs of the MATC area. This study showed that if the MATC were connected to the City's system, it would be on two pressure zones. The two hills (Main Hill and SM/PP Hill) areas would be on the City's medium pressure zone and the valley between the hills and the south property would be on the low-pressure system. This study recommended that a 12" low-pressure loop be connected on site from Mound Road to Dayton-Cincinnati Road. The most economical route is to follow the proposed alignment of Vanguard Boulevard. For the medium pressure system, the City will need to complete some off-site improvements to its system. They are in process of working on these activities. In addition, MMCIC conducted a more detailed study of the water system needs on the site. This study was conducted using the base study that was completed by the City but narrowing the focus to the MATC. The study should the same results for the low-pressure system with recommendation for some internal site loops and connects at the building/parcel level. For the medium pressure system, the study showed that the 12" lines installed during the East Boundary Project along Mound Road and the Upper Hill Projects were correct. It was determined that on Main Hill, some of the existing 8" water lines could be used to complete the loop around the hill. On SM/PP Hill, the 8" water line that runs along the cul-de-sac will be extended to the south to Benner Road and then east to the MMCIC property line. At that point it will need to be connected to a future, planned line that will need to be installed by the City. The City would need to connect this line to the water line that is being installed by a developer at the intersection of Mound Avenue and Benner Road. By completing this loop, adequate volume and pressure would be available to meet the needs in this area. Another recommendation would be to provide a secondary tie to the Main Hill area from the SM/PP Hill. Based on current information, the existing 8" line between the two hills could be connected to the new system, with proper connections, testing and valving, that would meet the needs of the areas in case of a pipeline break.

Building Modifications and Code

MMCIC has evaluated certain transition buildings, reviewed the costs of the buildings already transferred and adjusted the cost figures for this addendum for certain buildings based on this knowledge. The buildings evaluated in this review were: 3, 48, 60, 61, 63, 89, 100, 105, COS, GH, and GP-1. The evaluation showed that the original estimates where higher than what is needed to be expended to bring the buildings up to Code. Based on this evaluation MMCIC staff updated the Building Modification and Code estimates for the above mentioned buildings. In the future, we will be reviewing the balance of the transition buildings and updating this category for those facilities.

CRP & Addendum Cost Comparison

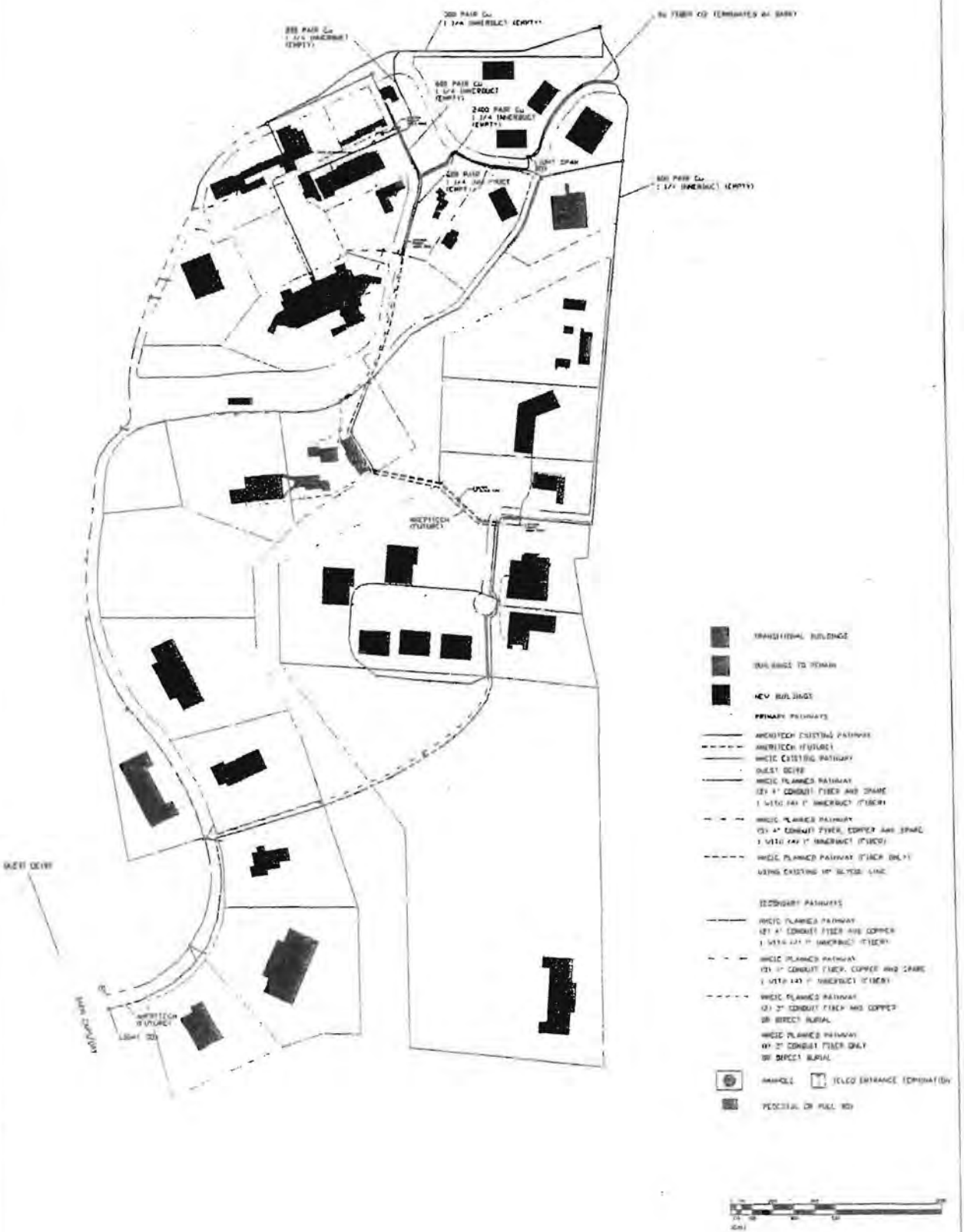
The costs to implement the revised plan elements were evaluated based on industry standards and past history and bids from projects on the site. Cost estimates were developed for the improvements and a comparison was prepared between the August

1999 Addendum and this revision. The results of this cost comparison are shown in Attachment A. The Estimated Cost for completion of the CRP based on this Addendum is $49.3 million compared to $49.6 million estimate in the August 1999 Addendum.

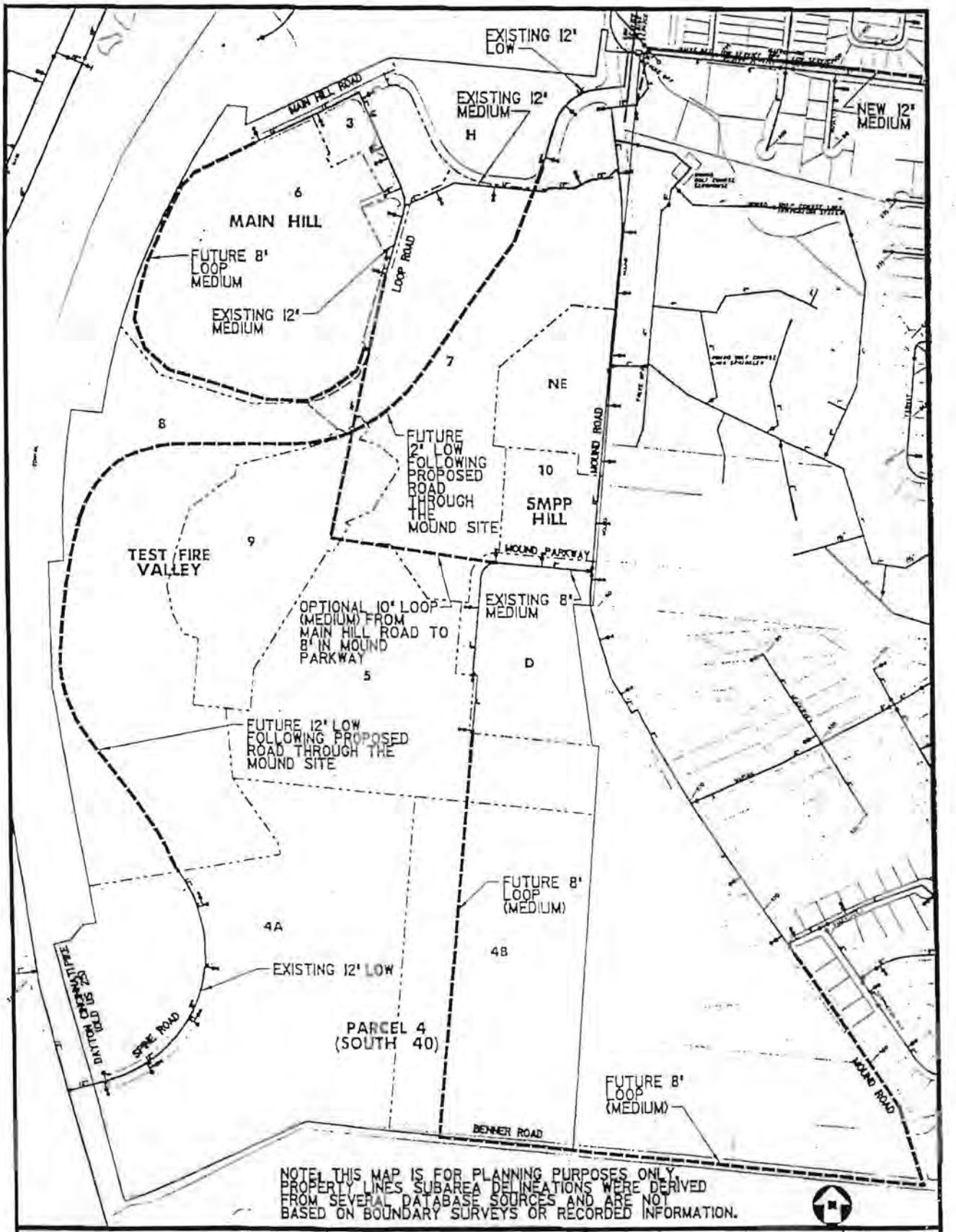
Summary

This Comprehensive Reuse Plan Addendum is a further refinement of the original plan. This Addendum updates the plans for the water system, the communications duct-bank and getting the buildings up to code. The attached mapping shows the updated water and communication plans. . This Addendum is based on the knowledge gained by implementing several projects on site, detailed studies of the water and communications systems and discussions with on-site personnel and Utility providers. Even with these adjustments, the objective of the reuse plan to create a privately owned industrial technology park remains the same. This addendum refines the goal and updates the financial liabilities to complete the project.

MMCIC
IT INFRASTRUCTURE SITE PLAN



DRAWING NUMBER	DATE	REVISION		MIAMISBURG MOUND COMMUNITY IMPROVEMENT CORPORATION	Mound	CETCON
MMC-C001	04/03/01	1.0				
	SCALE SEE DIAGRAM					



NOTE: THIS MAP IS FOR PLANNING PURPOSES ONLY. PROPERTY LINES SUBAREA DELINEATIONS WERE DERIVED FROM SEVERAL DATABASE SOURCES AND ARE NOT BASED ON BOUNDARY SURVEYS OR RECORDED INFORMATION.

BWSC
BARGE WAGGONER SUMNER & CANNON, INC.
ENGINEERS ARCHITECTS PLANNERS AND SURVEYORS

EXHIBIT 1

MIAMISBURG WATER STUDY (MOUND AREA)

DRAWN BY: CMB	TECHNICIAN: LLC
DRAWING NO.:	
PROJECT NO.: 19444-00	DATE: AUG. 2001

CRP ADDENDUM - ATTACHMENT A

SASAKI COMPARISON CRP & ADDENDUMS

ITEM	*Sasaki Cost*	*Addendum1*	*Addendum2*
Site Related Costs			
Water/Waste water	1,289,063	1,289,063	2,775,738
Gas/Electric/Communications	2,968,750	2,968,750	3,096,957
Stormwater Sewer/Detention	2,554,687	2,554,687	2,554,687
Road Improvements	1,720,313	5,799,758	5,799,758
Road Lighting	362,500	362,500	362,500
Parking	1,415,625	1,415,625	1,415,625
Parking/Site Lighting	623,437	623,437	623,437
Stanchion Lines/Fence Removal	625,000	625,000	625,000
Formal Landscape Areas	1,981,250	1,981,250	1,981,250
Natural Landscape Areas	2,148,437	2,148,237	2,148,237
Subtotal	**15,689,062**	**19,768,307**	**21,383,189**
Building Related Costs			
Cost to Bring Buildings Up to Code	11,790,625	11,335,775	9,491,153
Plumbing/Electrical Upgrades	525,000	642,170	642,170
HVAC Improvements	8,918,750	5,906,347	5,906,347
Deferred Maintenance	5,312,500	4,485,400	4,485,400
Building Demolition	1,885,937	3,042,937	3,042,937
Subtotal	**28,432,812**	**25,412,629**	**23,568,007**
Tenant Improvements	**$4,173,000**	**4,411,380**	**4,411,380**
TOTAL COSTS	**$48,294,874**	**49,592,316**	**49,362,576**

5. FINANCIAL EVALUATION OF OPTIONS

INSERT

Financial Analysis

Introduction

The level of success achieved in creating a viable reuse strategy for the Miamisburg Mound is a function of physical and economic factors. It has already been emphasized that the Mound site is handicapped by a variety of physical problems, including functional obsolescence, inefficient utilities, poor parking arrangements, as well as radioactive and chemical contamination. Following the dictates of federal law, DoE is funding environmental remediation for the Mound; additional DoE-earmarked federal dollars are covering a portion of infrastructure refit and operations costs for the Mound redevelopment effort. However, preliminary cost estimates for necessary infrastructure improvement may greatly exceed current DoE financial commitments. It must be emphasized that, in order for the site and facilities to be marketable to the private sector, both infrastructure improvement and environmental remediation are absolutely necessary.

In an effort to define the redevelopment potential of the Mound facility, three alternative development options were created by MMCIC. The options identify three concepts for redevelopment: a simple industrial park, a hybrid real estate development with both industrial and R&D functions, and a pure research and testing facility. Although the financial and market analyses treat each redevelopment concept as a separate and distinct option, actual redevelopment of the Mound could occur in a hybrid fashion, incorporating elements of one or more of the existing options. Each alternative incorporates a variety of land use types, development densities, and infrastructure requirements, with different mixes of existing space and new construction. The alternatives are defined as follows:

- **The Industrial Park Option** calls for a wide range of industrial development, allowing both new construction while preserving existing structures. Although building design and land use codes would be flexible, the wide range of uses and building designs may or may not be complementary. This option assumes that existing infrastructure and improvements would be reused as much as possible; that vacant land will be sold in bulk; that facilities on the central utility system will be converted to individual systems, and that new buildings will have individual HVAC systems. The scenario also assumes that all space is brought up to code, and leased in "as is" condition.

- **The Industrial and Technology Center Option** envisions a combination of industrial, office, and technology activities, utilizing existing mound facilities where possible. Demolition of some facilities will occur, allowing for a cluster style of development to emerge, with a business technology center cluster on "the hill", and light industrial uses elsewhere on the site. Certain clusters would have higher building design standards, so as to attract a more diverse tenant base. This scenario assumes that existing infrastructure and improvements will be maintained as much as possible; that the "main hill" will retain its general character, albeit with better parking, organization, and

more open space; land development will occur on frontage properties, through a joint venture arrangement with a local developer; all buildings will be brought up to code, and additional tenant improvement allowances will be provided by MMCIC to further refit existing facilities.

- **The Technology Center Option** envisions the development of a campus-style center incorporating R&D, testing, training, and some manufacturing, based on existing technologies at the Mound. The scenario incorporates a lower-density pattern of development, with more demolition of existing improvements and alteration of road alignments, and more strict building design standards. The plan assumes land sales in smaller increments, 3-5 acres per year. Buildings will have individual HVAC systems and improved parking arrangements. The third option would result in a park which is roughly comparable to the Miami Valley Research Park, in terms of density and use. The plan also assumes that existing facilities will be brought up to current building and life/safety codes, with additional allowances for tenant improvements.

For each option, ERA has forecast revenue streams based on achievable land values and rents for each space category. The revenue projections also incorporate space and land absorption rates which are defined by the market dictates of each option. The analysis also utilizes projections for operating expenses and tenant pass-through costs which were derived from data supplied by MMCIC officials. In the financial projections, ERA used financial, engineering, and planning data from a variety of sources, including MMCIC, DoE, Sasaki Associates, and URS Consultants. Cost estimates for building code upgrades, site improvement costs, and HVAC refit were generated by URS Consultants and Sasaki Associates.

The analysis also incorporates previous conclusions regarding growth potential for industrial sectors in the Dayton area that may have need for the advanced testing and manufacturing equipment and facilities at the Mound. Trends at other R&D business park facilities in the Midwest were also reviewed, in order to evaluate the nature of operating expenditures for business park/R&D facilities in general. The section concludes with a set iterative financial pro formas for each option, which test the sensitivity of MMCIC cash flow to possible changes in absorption, operating expenses, and infrastructure cost responsibility. Results of the pro forma analysis are then used to generate projections of likely economic impacts, including both jobs and taxes, that are likely to accrue to the City of Miamisburg, if the Mound is redeveloped.

Forecast Pro Forma Assumptions

The Mound redevelopment alternatives incorporate a range of assumptions concerning absorption & lease rates, DoE subsidies, land value, operating costs, tenant improvement allowances, and other factors. In the majority of cases, support for assumptions is based on either market information or MMCIC directives; in the few situations where an assumption cannot be based on quantifiable factors, due to future uncertainty or lack of data, for example, ERA has noted it. The following discussion outlines assumptions which are applicable for redevelopment alternatives 1, 2, and 3. Additional assumptions relating to each individual option will be discussed when relevant.

Lease Rate Estimates

Rental income is assumed to be the primary source of consistent MMCIC revenue in the future. The leasable property types, including warehouse, general industrial, research and development (R&D), office, as well as specific use space for explosives, will be vacated by DoE gradually through the year 2005. Three general assumptions shaped the determination of net rents for Mound space:

- First, it is assumed that the Mound will offer lease rates at the lower end or below Dayton market, in order to attract tenants.
- Second, that all existing buildings must be brought up to current building, health, and safety codes in order to be marketable.
- Third, as utility costs associated with the existing Mound HVAC system are currently above industry standards, it is assumed that MMCIC will absorb the above-market increment of utility costs which cannot be passed-through to tenants during the HVAC change-over process to individual HVAC systems. The above-market increment of utility costs is a burden to MMCIC; determination of a method to reduce this cost burden should be part of the negotiation process with DoE.

A range of net lease rates were identified for each property type based on the dictates of each scenario, in line with market rents in the Dayton area. For the first scenario, the industrial park, all existing buildings would be brought to code and leased on an "as is" basis. The second and third scenarios would allow for tenant improvement allowances, funded by MMCIC, beyond basic code improvements. As these options will offer a better-quality product, ERA is assuming that space in the second and third scenarios will command slightly higher rent levels, compared to the first scenario.

Office Rent Levels

For office rent comparables, ERA looked at older existing space along Dorothy Lane and South Dixie Drive, in Kettering, just east of I-75 and Route 741. Rent levels in this area are typically in the $9.00 to $12.00 per-square-foot range, full service, with utilities and operating costs accounting for roughly $4.00 per square-foot of the total. Office space in this area was typically built during two periods, 1957 to 1966 and 1980 to 1992. The majority of space was developed by 1966, roughly 254,400 square feet. 1995 vacancy for this increment of space was roughly 7%. Older office space in the area is typically low-rise, two- or three-story brick construction with older and out-dated window fenestration, as well as smaller and inflexible floor-plates. Several of the older buildings have been fully renovated, and now achieve rents in the $11 per square-foot range, full service.

ERA considers the older space along the South Dixie Drive corridor to be roughly comparable to the Mound in terms of age, condition, and likely users. The majority of space proximate to the Mound was built more recently, between 1985 and 1991, is in superior condition, and offers superior locations in the market. Asking rents for newer office space in the Miamisburg area range from $10 to $14 per square-foot (net), with operating expenses of between $4 and $6 per square-foot. Leases for older office space are typically structured on a gross basis, incorporating utilities and operating costs in the rent payment. Although local brokers were unable to provide a specific breakdown of utility costs as a percentage of the total lease rate for older space, one broker estimated that utilities amounted to between $1.25 and $1.75 per square-foot.

Office space at the Mound would rent at a discount due to increased distance from I-75, as well as higher operating costs and functional obsolescence. ERA would estimate that Mound office rents of between $4 and $5 per square foot (net) are achievable, with Option 1 supporting a rent of $4, Option 2 supporting a rent of $4.50, and Option 3 supporting a rent of $5. It should be noted that the majority of office space at the Mound, more than 200,000 square feet, will not be released by DoE until 2005. Assuming that office spaces at the Mound are properly maintained by DoE through 2005, and that tenant operating cost pass-throughs are maintained at market rates, the aforementioned lease rates should be achievable. DoE currently charges MMCIC a flat rate for utilities which is substantially above market rates; if the operating expanse pass-through for utilities is not subsidized, effective net rents would need to be lower. Detailed discussion of assumptions for utilities occurs in an upcoming section.

Industrial Rent Levels

For industrial rent comparable, ERA examined a range of industrial developments in the Dayton area, with specific emphasis on older warehouse and general industrial space in Kettering, Miamisburg, and Moraine, as well as new construction in Springboro. Rent levels for industrial space in the southern market

are tied to several factors, including the percentage of office build-out as well as property location. Property age and condition is also a factor, in as much as it separates investment-grade space from older property. The analysis found that recently built, investment-grade industrial space was achieving rents of between $3.50 and $4.50 per square foot (net), with operating expenses accounting for an additional $3.00 to $4.00 per square-foot. Rents for industrial space in the Springboro area, southeast of Miamisburg, are at the high end-of-the-range, around $4.15 per square-foot (net) plus expenses.

Rents for industrial space in the Springboro area are slightly higher by comparison, due to the investment-grade nature of construction and proximate interstate access. A sample of older industrial space product in the southern submarket (roughly 40,000 square feet) is located near the GM manufacturing facility in Moraine on Encrete Road, east of I-75 and north of Miamisburg; space in this area was built between 1959 and 1967 and is achieving net rents of between $3.00 and $3.50 per square-foot, net.

Expense pass-throughs for utilities vary considerably for industrial uses; an ERA survey of utility costs for industrial space indicated that utilities can run anywhere between $0.80 and $1.50 per square foot. Warehouse space typically has the lowest utility costs, while manufacturing has higher utility costs.

For tenants who do not require the high clear-ceiling heights, superior amenities, and greater efficiency provided by investment-grade industrial or flex space, older industrial space product remains an attractive alternative, particularly if building HVAC systems and layout are functional. Currently, industrial space at the Mound is tied to an inefficient central utility system, and has generally inflexible floor-layouts, particularly for private-sector tenants. Mound refit and renovation plans are designed to minimize these deficiencies.

Once brought up to code, ERA estimates that general industrial rents of between $3 and $4 per square-foot (net) are achievable. In the pro forma analysis, industrial space in Option 1 would rent at $3 per square foot (net). Option 2 at $3.50 per square foot (net), and Option 3 at $4.00 per square foot (net). Explosives space at the Mound would command slightly higher rents, due to the existence of specialized testing and analysis equipment for explosives testing and production. ERA would estimate that explosives space would achieve rents of between $4 and $5 per square foot, with Option 1 achieving the $4 /square foot rent level, Option 2 achieving a $4.50 /square foot rate, and Option 3 achieving a $5 /square foot rate. Warehouse space should achieve rents between $2 and $3 per square foot, with space in Option 1 leasing at $2/square foot, space in Option 2 leasing at $2.50/square foot, and space in option 3 leasing at $3.00/square foot.

Recently built flex office/warehouse/R&D space, which incorporates a larger office build-out along with investment-grade qualities, generally achieves higher net rents, in the range of $8 to $9 per square foot, net. Recent flex space development has occurred at the Newmark Center, located east of I-75 and south

of the Dayton Mall. The Miami Valley Research Park has emerged as a center of office and flex space development, particularly for R&D activities; the park has a total inventory of roughly 715,000 square feet, which has been built since 1985. The research park, located in Kettering and Beavercreek, charges between $15 and $17 per square-foot for office and flex space, full-service; operating expenses account for about $4.50 per square-foot. Research park officials indicated that rent levels in the park are targeted between 5% and 10% below prevailing rates in the Wright-Patterson Air Force Base market area.

Determination of net lease rates for Mound R&D space is made difficult by the fact that Mound lab spaces were built over a long time period for a variety of uses; as a result, there will be considerable variability in achievable lease rates for this space. Assuming that all R&D space on the Mound is brought up to code, ERA would estimate that rents for R&D space could fall in the $4 to $5 per square foot range, with Alternative 1 achieving the $4/square foot rent level, Alternative 2 achieving a $4.50/square foot rate, and Alternative 3 achieving a $5/square foot rate. ERA is assuming that rents for specialized space will be comparable to rents for R&D lab facilities. Although the specialized space is generally improved with extra equipment, ERA is assuming that, while the existence of such equipment will serve as an incentive to attract new tenants, no additional rental income will be derived from use of such equipment. Table 1 highlights the range of rent levels used in the analysis.

Table 1: Forecast Net Lease Rates

Lease Rates	Option 1	Option 2	Option 3
R&D Space	$4.00	$4.50	$5.00
Warehouse Space	$2.00	$2.50	$3.00
Office Space	$4.00	$4.50	$5.00
General Industrial	$3.00	$3.50	$4.00
Explosives	$4.00	$4.50	$5.00
Note: All rates are net, per square-foot of space			

Rent Escalation

Achievable Mound rents will need to remain constant for at least the next three years. This conclusion is based on the following evidence:

- First, as MMCIC does not have the option of completely shutting down the Mound for five to ten years to fully renovate and clean-up the facility at once; they must gradually phase in the improvements, while renting space to cover operating costs. Companies which rent space during the redevelopment period will have to deal with the range of physical problems, as well as construction, at the Mound. In order to attract firms during the renovation, MMCIC will need to discount rents, regardless of the level of build-out.

- The MMCIC is currently passing through a full range of expenses, including utilities, insurance, payment in lieu of taxes, general maintenance, property management, pest control, and trash removal, to market-rent tenants. Utilities, in particular, are passed through at roughly 50% to 100% above market rates. In the local market, utilities average between $0.80 and $1.50 per square foot; Mound tenants currently pay $2.84 per square-foot. In order to attract tenants to the Mound, the MMCIC will need to reduce pass-through charges to compensate for above-market utilities. Also, since Mound spaces are not individually metered for utilities, those tenants which have minimal utility consumption are effectively subsidizing higher-usage tenants, since all tenants pay utility costs on a per square-foot basis.

- Particularly for the R&D campus scenario, the Mound would compete against the already established Miami Valley Research Park for R&D tenants. The Miami Valley Research Park has a tenant base which is largely tied to Wright-Patterson Air Force Base (about 60%). Since 1985, the existing R&D park has averaged about 65,000 square feet of absorption per year; the park has enough vacant land for a 40-year build-out. The Mound would be competing for R&D tenants against an established park in the Dayton market, where the majority of demand is created by government, where growth potential is minimal. Although the Mound does have R&D testing and production equipment which may attract tenants, the long-term viability of this equipment has not yet been established.

The pro forma analysis assumes that Mound rents can begin to escalate after 2000 at a rate of roughly 2% annually, which is roughly equivalent to current inflation rates.

DoE Subsidies

According to MMCIC, DoE agreed to provide a $12 million subsidy to MMCIC to cover costs of operating the facility during conversion. ERA discussions with MMCIC officials indicated that a portion of this money has already been spent. MMCIC officials indicated that roughly $7.9 million would remain after 1996. ERA analysis of MMCIC financial data indicated that, since 1996 usage of the subsidy was budgeted but not yet entirely spent, it would be possible to save a larger portion of the subsidy for 1997 and beyond. As such, ERA is assuming that $9 million of the subsidy will be available in 1997.

Market-Rate Absorption Assumptions

The majority of income potential will be generated by lease income from existing facilities; thus, rates of absorption for this space are critical. Determination of absorption rates for each scenario was based on our conclusions concerning the competitive position that the Mound can achieve in each scenario; that is, the implications of target markets, investment levels, income goals, and the impact of rents on leasing. Based on our market study, which evaluated overall

demand for office, industrial, and R&D space in the Dayton area, ERA generated demand and sales forecasts for Option 1, which are shown below:

- Industrial space absorption of 40,000 square feet annually.
- R&D space absorption of 20,000 square feet annually.
- Office absorption of 5,000 square feet annually between 1997 - 2004.
- Office absorption of 25,000 square feet annually between 2005 - 2010.
- Bulk sale of "South 40" tract to private developer in 2002.

While the first option would allow a potentially more diverse array of uses and tenants compared to the other alternatives, it would not incorporate any tenant improvement allowances for build-out beyond code compliance for industrial, R&D, or office uses. ERA's analysis of the Dayton market shows that most industrial users do not expect to receive an allowance for space which is code compliant; however, office and R&D users would expect such an allowance. As a result, Option 1 shows minimal office absorption activity (5,000 square feet annually), and reduced R&D space absorption, compared to Options 2 and 3. Also, as a proportion of existing Mound facilities are inflexible, requiring additional tenant allowances in order to encourage lease-up, industrial space absorption was reduced, compared to Options 2 and 3, to 40,000 square feet annually. For office space which comes on line after 2005, ERA is assuming a higher rate of absorption, due to the nature of the space, (pure office uses), recent age of construction, and an assumption that DoE will properly maintain it between 1997 and 2005.

Absorption rates for Option 2 were based on ERA judgments of relative differences in terms of market segmentation and probable capture between Options 1 and 2. Based on this comparison, ERA determined that Option 2 would have a substantially larger office space absorption rate compared to Scenario 1, and slightly higher industrial space absorption rates, because MMCIC is assumed to offer tenant improvement allowances, making Mound space more attractive to prospective tenants. In addition, the level of infrastructure investment identified for Option 2 would make the park a more attractive location. Also, Option 2 assumes a joint-venture land development arrangement with a private real estate developer(specifics for the joint venture are described later in this section). Shown below are ERA absorption estimates for Option 2:

- Industrial space absorption of 50,000 square feet annually.
- R&D space absorption of 25,000 square feet annually.
- Office absorption of 25,000 square feet annually.
- Industrial & R&D land absorption of 5 acres every-other-year, starting in 2002.

Absorption estimates for Option 3 are based on the premise that the Mound will be redeveloped into a R&D park similar to the existing Miami Valley Research Center. Under this alternative, the Mound would be competing in a very

small market, resulting in a maximum annual absorption rate of 25,000 square feet.

Delayed Absorption Assumption

ERA prepared an alternative version of each Mound redevelopment option which incorporates an assumption for delayed absorption of existing space. The delayed absorption alternative looks at the impact on revenue and operating costs if existing space absorption is delayed/reduced between 1997 and 1999 by about 50% annually, compared to market-rate absorption. ERA believes that reduced absorption between 1997 and 2000 is likely, given the unique nature of problems associated with the site. ERA identified several possible delay-causing events, including:

- The existence of radioactive contamination on the site, which may have a substantial effect on space absorption during the 10-year remediation process. Although the government commitment to accept future liability for the impact of radioactivity on the site will aid in the marketing effort, fear of the unknown, i.e., the effect of long-term exposure to radiation may dissuade a good proportion of tenants from leasing space at the site.

- The fact that marketability of Mound facilities to mainstream industrial development is predicated on facility renovation to current building and life/safety codes. Delays created by unexpected engineering or design problems will influence absorption.

- Since the Mound redevelopment effort will only be feasible if DoE agrees to fund a larger share of infrastructure improvements, the rate at which improvements are made will be influenced by financial appropriations, which tend to be influenced by political whim. Delayed appropriations will have a negative impact on absorption, to the extent that necessary infrastructure improvements may be delayed.

Mound Current Operating Cost Discussion

Determination of operating costs associated with management and operations for the Mound was based on analysis of current and 1996 projected MMCIC operating costs, as well as a survey of other Midwestern Business/R&D parks. The range of costs incurred by MMCIC include administrative, salary & benefits, professional consulting, maintenance, management contracts, utilities, marketing, and insurance. Additional costs, associated with building refit & renovation, HVAC installation, landscaping, parking, and demolition will be discussed separately. As Table 2 shows, MMCIC has budgeted roughly $3.5 million for operation in 1996. ERA analyzed the nature of projected 1996 operating expenses with the assistance of MMCIC officials to identify the line items associated with each expense category, and to determine the sensitivity of

each expense category to changes in space inventories. The ensuing discussion highlights the results of this analysis for each expense category.

Table 2: 1996 MMCIC Budgeted Operating Expenses

Expense Category	1996 Budget
Salaries & Benefits	$430,642
Administrative	$146,455
Utilities	$491,652
Professional	$1,535,590
Marketing	$165,736
Facility Maintenance	$150,980
Facility Administration	$125,902
Liability Insurance	$7,042
Total:	**$3,484,641**

Payroll & Benefits - MMCIC currently has a full-time staff of seven, which includes management as well as administrative staff. The 1996 budget for salaries and benefits is $430,642; benefits account for roughly 25% of the total budgeted cost. ERA was informed by MMCIC officials that they plan to add up to two additional full-time positions per-year through 2000, with all positions gaining salary increases of 3% per year. The MMCIC also employs a range of independent consultants, who are covered under a separate expense category.

Administrative - Expenses for administrative costs cover a broad spectrum, including telephone, postage, office supplies, meetings, travel, and equipment rental. About $146,000 was budgeted in 1996 for this category, with the line items for travel & transportation as well as meetings & conventions covering about 38% and 18%, respectively, of the total. The 1996 budget for telecommunications included roughly $18,000 for new systems; MMCIC staff indicated that the $18,000 will not be spent, reducing total administrative expenses to $128,000, increasing the two largest line items to 43% and 21% of total administrative expenses.

Utilities - MMCIC is currently paying $2.84 per square-foot to DoE for utility costs on an annual basis. The utility rate covers heat & air conditioning (HVAC), as well as electricity. MMCIC pays the flat rate on all space inventories under their control. Since Mound tenants currently do not have individually metered spaces, MMCIC passes-through all utility expenses to un-subsidized tenants on a per-square-foot basis, irrespective of actual utility usage or the type of space (office or industrial) utilized. A total of $491,652 was budgeted for utility costs in 1996, which equates to roughly 173,115 square feet of space at $2.84 per square foot. MMCIC officials indicated that they expect the electricity component of total utility costs to increase in the near future; electricity costs currently take up about 40% of the $2.84 per-square-foot utility charge.

Professional - MMCIC employs a range of independent consultants to perform a variety of services. The 1996 budget has allocated $1,535,590 for consulting services. The allocated amount covers individual studies, including this project, as well as long-term consulting contract employment. MMCIC officials indicated that roughly $100,000 of the professional budget is for long-term employment contracts; short-term contracts (less than one year) should account for the remainder.

Marketing - The MMCIC budget includes $165,736 for marketing; roughly 65% of the 1996 marketing budget is allocated to the creation of a brochure and a video. The MMCIC official responsible for marketing indicated that total marketing expenditures in 1997 and beyond would be lower than 1996. MMCIC has a full-time marketing person, whose salary is allocated to the salary and benefits category.

Facility Maintenance - This expense category covers several items, including trash collection, pest control, cleaning & painting, and general repairs. A total of $150,980 is budgeted for 1996, with the majority of funds being allocated to janitorial ($54,600) and general repairs ($46,560). Facility maintenance costs are largely tied to the amount of office, industrial, or lab space in inventory at any given time; as such it can be expected that such costs will increase over time as the MMCIC space inventory grows. According to MMCIC officials, all facility maintenance costs are passed through to tenants, with the exception of subsidized tenants, who only pay a below-market rent.

Facility Administration - Expenses for facility administration include contracts for property management, security, and building insurance coverage; these costs are passed-through to non-subsidized Mound tenants. The total amount budgeted for this category in 1996 is $125,902. Property management is provided by Larry Stein Realty at a cost of about $0.33 per square foot for all property types. Property insurance for the Mound, estimated at $33,351 annually, is based on the value of property and equipment ($0.10 per $100 of value),as well as liability ($0.03 cents per square foot). Budgeted costs for security are $3,400, which covers the cost of a security system. Although the costs of security will likely increase as MMCIC takes over additional buildings, the extent of increase is unclear at present. The facilities administration line item also includes a payment of $53,418 in lieu of property taxes. The tax resulted from negotiations between the local school board and the City of Miamisburg; the rate is about $0.45 cents per square-foot, and will increase as inventory grows. The local school district receives 60% of the revenue collected from this tax.

Liability Insurance - Expenses for general and professional liability insurance constitute the smallest line items in Table 12. The 1996 budget has allocated roughly $7,000 for liability insurance. This cost should expand as indicated staffing levels increase.

Security - Security is covered by MMCIC for certain tenants. It is totally unclear how tenant security needs will change; since only $3,400 was budgeted for security in 1996, this amount is small in the greater scheme of things and will be ignored.

Experience at other Research Parks

In order to gain perspective into the significance of operating costs identified for the Mound, ERA surveyed other research facilities in the midwest to qualify variations in operating costs and profit motivation. A total of six parks in Indiana and Ohio were surveyed, four of the respondents are discussed below; the fifth park, the Miami Valley Research Park, was described earlier, in the market analysis section of this report.

- **Purdue University Research Park** - The R&D park at Purdue University was developed in 1961, and currently contains about 35 buildings. The park, whose mission is to create tech transfer opportunities for university research, is managed by a not-for-profit foundation, which is responsible for the park, as well as other fund raising and real estate efforts at Purdue. The park is funded primarily by land sales, which generate revenue to cover the majority of operating costs. The park itself has no full-time staff, which is consistent with its goal of maintaining low operating costs.

- **Ohio State University Research Park** - The OSU research park is located in Columbus, Ohio. The park has seven buildings covering about 850,000 square feet of space; about 150,000 square feet of space is vacant. The park is geared toward tenants who will support the university's research and educational missions; the park is operated on a 'break-even' financial basis. University officials indicated that revenue from leases covers building operations and maintenance; administrative tasks for the park are partially subsidized by the university. A university official indicated that they are setting up a separate corporation for the research park. Current pro forma estimates for administrative costs under the new corporation are about $500,000 annually, with a full-time staff of three. The new corporation will separate overall university real estate operations and research park activities into separate entities. The official indicated that, although the park will continue to receive subsidies for administrative costs through the near future, eventually the research park entity will be entirely self-supporting, with lower operating costs.

- **Northwestern University Research Park** - Located in the northern suburbs of Chicago, the Northwestern University research park was a creation of the university and the City of Evanston as a for-profit operation. The park was built on under-utilized land, incorporating renovation of existing space with new construction by private developers. The park was improved with four buildings totaling about 250,000 square feet. Three of the buildings are privately owned; the fourth was built with U.S. Department of Energy funds

for the University. The park is financed primarily by equal contributions from the university and the city of about $500,000 annually. The park receives minimal income from land leases and incubator space. One mission of the research park is tech-transfer, finding private-sector applications for university research activities. The park has a full time staff of one and administrative costs of about $125,000 annually.

- **University of Ohio Innovation Center and Research Park** - The University of Ohio at Athens maintains a 40,000 square foot business incubator to encourage high-tech development tied to university research missions. The facility also allows for tech transfer of university research discoveries to the private sector. Total budget for the facility is $350,000, of which about $150,000 covers operating costs. The park is funded by university subsidies.

Survey Implications

The survey of other R&D/business park facilities in the region indicates that one overriding factor which determines the operating cost structure of such facilities is the mission or goal of the facility. Most R&D/business park facilities were planned to support the educational mission of the parent university and to provide outlets for technical transfer of university research to the private sector. Two trends emerge in the examination of how other regional R&D/business park facilities focus on profitability. In one case, the park was directly tied in with the university, receiving a direct subsidy for operations. In the second case, the park was split-off as a separate entity, which may receive partial subsidies, but is primarily self-supporting. In either situation, all of the surveyed facilities are maintaining low operating costs, particularly for salaries. All of the respondents identified containment of operating costs as a goal.

The extent of comparability of the selected R&D/business park facilities to the Mound is limited however, in that each of the noted facilities has been in operation for several years, while the Mound is still in its infancy as a R&D/business park. Most established parks, such as the Miami Valley Research Center, have already generated locational and agglomeration economies, as well as critical mass, necessary to encourage new job growth.

The Mound facility is unique in that the existing R&D/testing equipment and related employment already exist, even though the reuse strategy has just begun. Even so, the existence of radioactive and chemical contamination on the site, as well as the old age and functional obsolescence of the existing improvements make comparability of the site to other R&D/business park facilities difficult at best. As a result, the financial analysis will be based less on comparability with other facilities, and more on budgets and information supplied by MMCIC officials. However, ERA will provide a set of pro forma iterations for each option which evaluate the impact of reduced MMCIC operating costs on profitability.

Land Absorption and Value

Each of the three scenarios incorporates a different style of land absorption. Option 1 assumes a bulk purchase by a single user of the 46.5 acres of developable land in the "south 40", which contains a total of about 140 acres. Option 2 assumes that MMCIC enters into a joint venture arrangement with a local real estate developer, using the value of the 46.5 acre parcel as its equity position in the joint venture. MMCIC would then receive a percentage of rental income generated by development on the 46.5 acre tract. The third option assumes that the vacant acreage will be parceled and taken-down in small increments to single users or developers.

ERA analyzed land sales activity in the southern submarket of Dayton to delineate likely amounts of land absorption activity at the Mound. Discussions with local brokers indicated that industrial land with interstate frontage is selling from $50,000 per acre and up. The mound site is about three miles west of I-75, with restricted interstate access, particularly for trucks. ERA has been informed that the City of Miamisburg has made a commitment to improve access to the Mound site as part of the redevelopment strategy.

Assuming that truck access is improved, the Mound would be roughly comparable to the Miamisburg northern industrial district, a mature single-tenant manufacturing and industrial area, in terms of access; the northern industrial district is nearly built out, however. ERA estimates that the range of achievable values for vacant land at the Mound would fall between $15,000 per acre and $25,000 per acre for smaller lots, or a bulk sale. The following assumptions will shape the land value conclusions:

- First, land sales activity should not begin until 2002, primarily because the current probable value of the South 40 acreage is negligible due to a combination of poor access and a large supply of vacant land in superior locations elsewhere in the Dayton area. By holding the South 40 acreage until 2002 or later, MMCIC would see the value of the acreage appreciate as Mound facilities are refitted, and released by DOE. Radiation clean-up will also be further along, improving site marketability.

- Second, although the <u>developable</u> South 40 acreage will be increasingly valuable under all three scenarios in 2002; the ±95 acres of undevelopable land would have negligible value, except possibly to meet zoning requirements for open space.

- Third, for Option 2, which assumes a joint venture arrangement between MMCIC and a developer, ERA is assuming that MMCIC would contribute 46.5 acres of land at a prospective value of $20,000 per acre. The developer would contribute the value of site infrastructure and improvements, which are valued at about $20 to $25 per square-foot for new industrial space. Based on

these values, the MMCIC would have a 30% interest in the venture, and would receive that increment of rental income from new development, beginning in 2002. Although this assumption does not allow for sales of individual parcels on the site in Option 2, individual land sales would be possible, in reality.

- Fourth, for Option 3, ERA assumes that demand would exist for absorption of 3 acres of land every other year beginning in 2002.

Achievable values for infill vacant sites on the Mound, which will be created as demolition of older property occurs, will be at the low end of the identified land value range, since they will be inferior to the South 40 acreage in terms of site flexibility.

Mound Projected Operating Expense Structure

Given the unique nature of Mound facilities, determination of projected operating expenses for the mound was based largely on information supplied by MMCIC, Sasaki Associates, and URS Consultants; ERA surveys of operating expenses at other R&D facilities in the Midwest did not reveal consistent information. Local real estate brokers were also surveyed, in order to determine typical market-rate operating expenses for office and industrial property in the market area. Information from each source was synthesized by ERA to arrive at operating expense projections for the Mound. Two preliminary hypotheses were used to shape the operating expense projections:

- First, that MMCIC will cover operating expenses with revenues generated from land sales, rents, and other consistent revenue sources, while utilizing DOE grant funds for infrastructure improvement, as much as possible.

- Second, particularly in the early years of the reuse strategy, operating expenses will be higher, particularly for salaries; ERA research into R&D park development determined that strong leadership and management are critical in determining the success or failure of such development; as such, MMCIC will hire the most qualified people for the job.

A total of six categories of operating expenses were identified: Salaries & Benefits, Administrative, Marketing, Professional Services, Tenant Improvement Allowances, and Space Carrying Costs. In addition, four categories of tenant pass-through expenses were identified: Property Maintenance & Management, Utilities, Property & Liability Insurance, and Payment in Lieu of Taxes. The following text describes both how each operating expense and pass-through value was arrived at, as well as how each value will expand or contract through the forecast period. For several operating expense line items, ERA chose to generate alternative expenditure levels, in order to highlight the specific impact of certain costs on revenue creation. The alternative expenditure levels were generated for Salaries & Benefits, Administrative, Marketing, and Professional Services.

Operating Expenses

Salaries and Benefits - Current MMCIC plans assume that 2 new salaried positions per-year through the year 2000 will be needed, with annual salary increases of 3%. Although hiring an additional eight employees by the year 2000 would increase total payroll expenses by over 100% in 2000, MMCIC officials have indicated that the process of redeveloping the Mound, which is a unique facility with special problems, will require the additional positions. ERA evaluated the position of MMCIC on Salaries & Benefits and chose to provide two alternative expense levels for Salaries & Benefits. As one alternative, ERA is assuming 1997 salaries and benefits of $577,935, with annual escalation as two new positions are created annually through 2000. The analysis assumes that an overall staff of 15 persons will be maintained between 2000 and 2003. Beginning in 2004 it is assumed that staffing will be reduced by two positions per year until 2008, after which a total of five people will be on staff. By 2008 the redevelopment effort should be complete, making the additional positions redundant. The average salary per person (with benefits) is assumed to be slightly more than $70,000 per year.

For the second, lower cost, alternative, ERA is assuming an MMCIC staff of 5 persons yearly between 1997 and 2002, falling to four people yearly between 2003 and 2010; the average salary per person (with benefits) is assumed to be slightly more than $70,000 per year. Justification for the alternative staffing level was based on extensive ERA experience in the redevelopment of other government facilities and military bases in the U.S. Based on this experience, ERA determined that the Mound could theoretically be redeveloped effectively with a staff of 4-5 people; staffing for short-term needs, including site planning, would be contracted to outside sources. Overall salaries for both Salary & Benefit levels will also increase by 3% annually, which is 1% greater than the assumed inflation rate of 2%.

Tenant Improvement Allowances - ERA analysis of real estate market activity in the Dayton area found that office tenants interested in first or second generation space typically expect an improvement allowance as part of the lease arrangement for build-out from shell space. The allowance for office tenants normally does not cover the entire cost of a build-out; local real estate brokers identified an allowance of $14 per square foot as standard. By comparison, most industrial users accept space on an "as is" basis, with build-out costs typically amortized over the lease term as an additional cost to the tenant. Tenant improvement allowances are more often given for older space which is not up to current code specifications.

As all existing space at the Mound will need to be brought up to code in order to be marketable, MMCIC would not need to offer allowances for this reason. However, ERA believes that MMCIC may need to offer some form of tenant improvement allowance, first as an incentive to attract tenants, and second, in recognition that space at the mound may require extra conversion costs which

may be excessive for a prospective tenant to bear alone. ERA evaluated current tenant improvement allowance practices in the Dayton market, and worked with other members of the consultant team to arrive at a set of allowance values, which are lowest for Option 1, and highest for Option 3. Table 3 highlights the allowances used in the analysis.

Table 3: Tenant Improvement Allowances

Space Type	Option 1	Option 2	Option 3
R/D	$0	$9	$12
warehouse	$0	$0	$0
Office	$0	$10	$15
Industrial	$0	$2	$4
Explosive	$0	$2	$4

Administrative - Costs associated with administrative needs, including postage, phones, and office supplies, as well as travel, are related primarily to staff size. ERA used MMCIC cost projections to generate estimates for administrative costs. ERA also prepared a low cost alternative. Based on MMCIC cost estimates, administrative costs are projected to grow annually between 1997 and 2003, based on 1996 administrative costs per employee, plus annual inflation; ERA is assuming 1997 administrative costs of $163,927, with 2% growth in costs over the forecast period, due to inflation. As the number of employees is projected to fall after 2003, administrative costs will also fall over the long term. Under the lower cost alternative prepared by ERA, administrative costs would fall to about $90,000 in 1997, and vary based on annual employment and inflation through 2010.

Marketing - A key component in the reuse strategy for the Mound is effective marketing. The MMCIC budgeted roughly $165,000 for 1996, which includes development of brochures and a video. MMCIC marketing official indicated that the marketing budget would fall after 1996. However, as the nature of Mound space inventories will change considerably between 1997 and 2000, prediction of marketing expenditures is difficult. ERA generated two forecasts for marketing expenses. Under one alternative, ERA assumed 1996 marketing expenses of $100,000, dropping on an annual basis at an effective rate of 8% through 2010. Under the lower cost alternative, 1996 marketing expenses were reduced annually at an effective rate of 20% through 2005, then held constant between 2003 and 2010. Given the nature of development issues associated with the Mound site and improvements, marketing will be critical in the early years of the facility's development.

Professional Services - Professional consultants provide a range of services to the Mound, including accounting, planning, engineering, architecture, and environmental testing, which are typically short-term in nature. The Mound also uses consultants to manage technology transfer programs. Use of consultant is attractive because they are paid on an hourly rate without benefits, which typically

add roughly 35% to individual salaries for entry and mid-level jobs. ERA prepared alternative cost structures for professional services, based on the fact the considerable variability could occur in the future for this category. As one alternative, 1996 professional expenditures of $750,000 are reduced annually by 8% through 2010. As a second, lower cost alternative, ERA forecast 1996 professional expenditures of $500,000, falling by 20% annually through 2005. Under the low staffing alternative, professional costs are held constant between 2005 and 2010.

Space Carrying Costs - For Mound space which is not absorbed in any given year, MMCIC must pay an additional cost for maintenance and utilities. ERA derived two levels of space carrying costs: $4.22 per square foot before utility switch-over to independent HVAC systems, and $2.00 per square foot after utility changeover. Use of two carrying cost rates is necessary because the majority of space will be vacant between 1997 and 2000, when HVAC refit will still be occurring, and MMCIC will pay a projected rate of about $3.00/square foot to DoE for utilities. Once all space is converted, MMCIC will pay a nominal utility rate for vacant space on a building-by-building basis plus maintenance costs which are assumed at $1.22 per square foot, according to MMCIC data.

Tenant Pass-Through Expenses

In addition to a net rental payment, each prospective Mound tenant will be responsible for payment of expenses to cover costs of utilities, property maintenance & management, insurance, and payments in lieu of taxes. These costs are paid initially by MMCIC, who is then reimbursed by the tenants. The financial pro forma assumes that MMCIC will be unable to pass-through to tenants 100% of all such costs between 1997 and 2001, due primarily to the above-market rates charged by DoE for utilities. The following discussion outlines the development of projected pass-through expenses for the analysis

Utilities - MMCIC currently pays DoE about $2.84 per-square-foot annually for utilities, and passes-through the utility costs to market-rent tenants on a per square-foot basis, regardless of the actual energy amount consumed. MMCIC indicated that subsidized tenants will not pay utility costs until 1998, when the incubator program is scheduled to finish. According to MMCIC, all utility costs will be passed through to tenants in 1999. ERA performed an analysis of net rental rates and tenant expenses to determine the extent to which the combination of net rents and expenses are attractive to prospective tenants. The analysis determined that full pass-through of the above-market utility costs would significantly reduce achievable Mound rents. In order to forecast utility costs, ERA has made three assumptions which are applicable to all scenarios:

- First, for system utility charges between 1997 and 1999, ERA is assuming an annual rate of $3.00 per square-foot; Once converted to individual HVAC systems, tenants will be responsible for their own utilities.

- Second, all options assume that MMCIC will be unable to pass through all utilities until 2002, when a majority of existing space should be converted to individual HVAC; between 1997 and 2001, a portion of pass through costs will need to be subsidized.
- Third, the scenarios all assume that HVAC retro-fit will begin as soon as possible for all buildings as they are vacated by DoE; all property is assumed to be on independent HVAC systems by 2005.

It should be emphasized that assumptions for yearly HVAC conversion rates are hypothetical; DoE has not, as of yet, committed to any program which leads to shut down of the existing central utility system. However, if existing Mound facilities are not converted, either MMCIC or DoE will need to subsidize the above-market increment of utility costs, otherwise tenants will simply choose to lease space somewhere else in the Dayton market.

Taxes - MMCIC is responsible for payment of "in lieu of" real estate taxes, 60% of which is allocated to the local school district. MMCIC official indicated that the tax is equivalent to $0.45 cents per square foot for all current space inventories. Roughly $53,400 was budgeted for this line item in 1996; MMCIC officials indicated that the full amount of this tax will be passed through to tenants, based on square footage, by 1999.

Facility Maintenance & Management - Expenses for general maintenance include janitorial, pest control, trash removal, and general repairs. The 1996 budget allocated $150,980 for this category, which is passed through to market-rent tenants. The pass-through is charged at a rate of $1.22 per-square-foot. Property management is conducted by Larry Stein Realty at a cost of $0.33 per square foot for total inventory.

Insurance - Insurance for Mound property is charged at a rate of $0.10 cents per $100 of value. Insurance for liability coverage is charged at a rate of $0.03 cents per square-foot. Judgment of the value of existing Mound improvements and equipment was based on copies of the insurance policy, provided by MMCIC officials. The policy indicated a current replacement value of property and Equipment under MMCIC control to be about $26 million, which will increase as new buildings are leased and refitted. All insurance charges are passed through to the tenants. MMCIC also pays professional liability insurance, which amounts to roughly $7,000 per year;

Infrastructure Improvement Options

The issue of infrastructure improvement is central to evaluation of reuse potential for the Mound. Improvements to utilities, roads, existing buildings, and parking arrangements, as well as demolition of older space, are all necessary for any reuse strategy to be viable. Building refit and site infrastructure cost estimates were generated by URS Consultants and Sasaki Associates and incorporated in the financial pro forma. ERA made two critical assumptions with regard to

infrastructure costs: First, since the likely revenue stream that MMCIC will generate from rents and land sales will be small when compared to the substantial cost of necessary infrastructure investment, a substantial increment of additional investment will be needed to cover infrastructure refit costs. Second, infrastructure investment must be made in the initial stages of Mound redevelopment, thereby enhancing site marketability; delays will increase costs, reduce revenues, and prolong the re-leasing process, creating uncertainty which may doom the reuse process.

Each of the alternative reuse options incorporates a different level of infrastructure investment. Option 1 includes costs to bring existing facilities up to current building, health, and safety codes, along with additional costs for road, sewer, utility, and parking improvements. Options 2 and 3 incorporate the same existing facility refit charges used in Option 1, along with additional costs for parking, utilities, landscaping, lighting, roadways, demolition, and sewer improvement. ERA generated alternative iterations of the three alternatives to determine the financial ramifications if MMCIC was responsible for a portion of infrastructure refit costs; otherwise all infrastructure costs are treated as a combined figure, absolutely necessary for each alternative to be marketable, but separate from the revenue and operating cost projections. All scenarios also incorporate projections for hard and soft costs associated with construction.

Pro Forma Analysis

In creating a financial model to project revenues and costs under the three alternative redevelopment options, ERA determined that there were several factors which, if varied, might have considerable impact on the financial viability of the site. Alternative pro formas were generated to test the relative impact of each factor on forecast revenues and costs; the pro formas are located at the end of this section. Three primary factors: Rate of absorption, variations in operating costs, and responsibility for infrastructure investment, were identified and tested in the financial model. A total of eight iterations were generated based on the three factors, for each scenario. A list of the eight iterations conducted for each of the three options is shown below:

1. Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs
2. Market Absorption, Low Operating Costs, and Split Infrastructure Costs
3. Market Absorption, MMCIC Operating Costs, and Combined Infrastructure
4. Market Absorption, Low Operating Costs, and Combined Infrastructure
5. Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs
6. Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs
7. Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure
8. Delayed Absorption, Low Operating Costs, and Combined Infrastructure

Based on analysis of the iterative financial pro formas for each option, the financial implications of each iteration are as follows:

Option 1 - Iteration 1:
Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs
ERA determined that this iteration of Option 1 was potentially feasible, with MMCIC using the DoE subsidy to cover operating cost deficits between 1997-2001 and 2003-2006. Roughly $810,000 of the DoE subsidy would remain unspent in 2006; net income between 2007 and 2010 would increase from $372,000 to $1.6 million. A land sale in 2002 would result in about $580,000 in net income for that year.

Option 1 - Iteration 2:
Market Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits in 1997 and 1998; roughly $5.9 million of the subsidy would remain unspent at the end of 1998. Net income would then increase yearly between 1997 and 2002, growing from $52,000 to $1.9 million. Net income is projected to fall between 2002 and 2005, to a low of $205,00, before growing to $1.9 million in 2010.

Option 1 - Iteration 3:
Market Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this iteration of Option 1 was potentially feasible, with MMCIC using the DoE subsidy to cover operating cost deficits between 1997-2001 and 2003-2006. Roughly $1.8 million of the DoE subsidy would remain unspent in 2006; net income between 2007 and 2010 would increase from $411,000 to $1.7 million. A land sale in 2002 would result in about $600,000 in net income for that year.

Option 1 - Iteration 4:
Market Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits in 1997 and 1998; roughly $6.85 million of the subsidy would remain unspent at the end of 1998. Net income would then increase yearly between 1999 and 2002, growing from $52,000 to $1.88 million. Net income is projected to fall between 2002 and 2005, to a low of $205,00, before growing to $1.97 million in 2010.

Option 1 - Iteration 5:
Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs - ERA determined that this option was potentially unfeasible, with the DoE subsidy being exhausted in the year 2000. Between 2000 and 2006, revenue is projected to exceed expenses in only one year, 2002. Between 2007 and 2010, revenue would increase from about $410,000 to almost $1.7 million.

Option 1 - Iteration 6:
Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 2000; roughly $2.8 million of the subsidy would remain unspent at the end of 1998. Net income would then increase in 2001 and 2002, growing from $382,000 to $1.78 million. Net income is projected to fall between 2002 and 2005, to a low of $242,00, before growing to over $2 million in 2010.

Option 1 - Iteration 7:
Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially unfeasible, with the DoE subsidy being exhausted in the year 2000. Between 2000 and 2006, revenue is projected to exceed expenses in only one year, 2002; Between 2007 and 2010, revenue would increase from about $419,000 to almost $1.7 million.

Option 1 - Iteration 8
Delayed Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 2000; roughly $3.7 million of the subsidy would remain unspent at the end of 1998. Net income would then increase in 2001 and 2002, growing from $382,000 to $1.78 million. Net income is projected to fall between 2002 and 2005, to a low of $242,00, before growing to over $2 million in 2010.

Option 2 - Iteration 1
Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1998. MMCIC is then projected to run annual operating deficits between 1998 and 2007.

Option 2 - Iteration 2
Market Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 1998, as well as 2005; just less than $1 million of the subsidy would remain unspent at the end of 2005. Net income would then increase gradually between 1999 and 2004, as well as 2006 to 2010.

Option 2 - Iteration 3
Market Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 2007; just less than $431,000 of the subsidy would remain unspent at the end of 2005. Net income would then increase gradually between 2008 and 2010, from $614,000 to over $1.4 million.

Option 2 - Iteration 4
Market Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 1998, as well as 2005; just less than $7.5 million of the subsidy would remain unspent at the end of 2005, since all infrastructure costs are combined and separated in the analysis. Net income would then increase gradually between 1999 and 2004

Option 2 - Iteration 5
Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs - ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1998. MMCIC is then projected to run annual operating deficits between 1998 and 2007.

Option 2 - Iteration 6
Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this scenario was probably not feasible, with the DoE subsidy being exhausted in 1998. Although MMCIC is then projected to run annual operating deficits 1998, 1999, and 2005, the facility is projected to generate positive cash flow in the remaining years (2000-2004 and 2006-2010).

Option 2 - Iteration 7
Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 2002. MMCIC is then projected to run annual operating deficits between 2002 and 2007.

Option 2 - Iteration 8
Delayed Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 1999, as well as 2005; just less than $4.6 million of the subsidy would remain unspent at the end of 2005, since all infrastructure costs are combined and separated in the analysis. Net income would then increase gradually between 1999 and 2004, as well as 2006 to 2010.

Option 3 - Iteration 1
Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1997. MMCIC is then projected to run annual operating deficits between 1997 and 2008.

Option 3 - Iteration 2
Market Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1997. MMCIC is then projected to run annual operating deficits between 1997 and 2001.

Option 3 - Iteration 3
Market Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 2001. MMCIC is then projected to run annual operating deficits between 2001 and 2008.

Option 3 - Iteration 4
Market Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this option was potentially feasible, with MMCIC relying on the DoE subsidy to cover operating expense deficits between 1997 and 2001, as well as 2005 to 2008; about $1.6 million of the subsidy would remain unspent at the end of 2005, since all infrastructure costs are combined and separated in the analysis. Net income would then increase gradually after 2009.

Option 3 - Iteration 5
Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs - ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1997. MMCIC is then projected to run annual operating deficits between 1997 and 2008.

Option 3 - Iteration 6
Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 1997. MMCIC is then projected to run annual operating deficits between 1997 and 2001, as well as 2005 to 2007.

Option 3 - Iteration 7
Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure
ERA determined that this scenario was not feasible, with the DoE subsidy being exhausted in 2000. MMCIC is then projected to run annual operating deficits between 2000 and 2007.

Option 3 - Iteration 8
Delayed Absorption, Low Operating Costs, and Combined Infrastructure
ERA determined that this scenario was probably not feasible. Although MMCIC is projected to generate positive cash flow in 2002 through 2004, the DoE subsidy is projected to run out in 2006. Annual operating deficits in 2006 and 2007 will then occur. The facility is projected to generate minimal positive cash flow between 2008 and 2010.

Conclusions

The analysis of pro forma iterations for each option indicated that the three factors identified by ERA will exert considerable influence over the financial feasibility of Mound redevelopment. The first factor, delayed absorption, is significant in that it reduces the revenue that MMCIC can generate from existing

space between 1997 and 1999, forcing them to utilize a larger share of the DoE subsidy to fund operating costs. If operating costs are kept high, the DoE subsidy will be consumed more quickly. For example, in Option 1, the combination of delayed absorption and regular (high) operating costs would result in DoE subsidy exhaustion by 2000, with no additional funds to cover projected deficits beyond 2000. However, if operating costs are reduced in Option 1, the projections indicate that MMCIC could survive delayed absorption, particularly since MMCIC would have minimal infrastructure cost responsibility.

The issue of infrastructure cost responsibility comes into play primarily for Options 2 and 3, when MMCIC may be responsible for a larger share of infrastructure costs. The analysis indicated that MMCIC could afford the cost of identified infrastructure responsibilities in Option 2, if market absorption occurs. However, if delayed absorption occurs in Option 2, the analysis indicates that the DoE subsidy will be insufficient to cover all operating cost deficits over the forecast period, given the infrastructure costs, even if MMCIC reduces their operating costs. If costs of infrastructure are taken out of the model, a considerable increment of DoE subsidy funds would be available to cover MMCIC operating deficits during the redevelopment effort.

Three points need to be emphasized:

- First, although rates of absorption and operating cost levels have a significant impact on financial feasibility, potential costs associated with infrastructure improvement, which MMCIC may or may not be responsible for, will be the deciding factor in determining financial feasibility.

- Second, beyond the issue of infrastructure costs, the analysis suggests that operating costs must be tied to a given level of revenue generation. Otherwise, MMCIC will not have the flexibility to deal with the potential for delayed absorption, which is likely.

- Third, the financial models generated by ERA are based on the reuse of specific Mound buildings, which are released by DoE over a specific time-period; exclusion or inclusion of individual buildings will have a demonstrable effect on the analysis results.

Economic Impact Discussion

There are two economic impacts of particular concern to this study: Job creation and taxes generated. Redevelopment of the Mound will provide new employment opportunities for the existing base of Mound employees, and generate revenue from taxes on income as well as real and personal property. The rate at which new jobs or taxes are created is tied to the amount of existing space which is absorbed and the acreage of vacant land which is developed under each option. ERA generated alternative projections of Mound employment, local income tax, and in lieu of property taxes on an annual basis for each option, based on market rate absorption and delayed absorption of Mound space.

Employment - Market Absorption

The Mound facility currently has an employment base of roughly 1,400 persons, which includes about 1,050 EG&G employees and 170 DoE employees; the Mound privatization effort has created an additional 190 jobs. Generation of Mound employment forecasts was based on two assumptions, which are as follows:

- First, That EG&G will draw its employment down from a current level of 1,050 to zero in 2005.
- Second, that DoE will leave the Mound entirely in 2005.

ERA based its forecast of private sector jobs on the amount of annual absorption for existing office, industrial, and R&D space, as well as developed land, projected under each option. ERA utilized industry rules-of-thumb for the amount of square feet per employee for industrial, R&D, or office space to generate the employment forecasts. The following table highlights the resulting Mound employment projections.

Table 4: Total Mound Employment and Local Income Taxes

Total Jobs	1996	2000	2005	2010
Option 1	1,408	1,610	1,569	2,135
Option 2	1,408	1,499	1,424	1,990
Option 3	1,408	1,183	1,088	1,375
Income Taxes	**1996**	**2000**	**2005**	**2010**
Option 1	$1,139,635	$1,166,966	$1,024,473	$1,380,196
Option 2	$1,163,400	$1,201,115	$1,107,879	$1,608,188
Option 3	$1,197,350	$1,064,458	$1,031,598	$1,428,411

The table shows that, for Option 1, total employment will increase through 2000 to a high of 1,610, before falling to 1,569 in 2005, and then recovering by

2010 to 2,135. Option 2 is projected to indicate a comparable pattern, with total employment rising through 2000, falling by 2005, and then recovering by 2010. Option 3, which assumes minimal annual absorption, shows that the number of jobs created between 1996 and 2010 is not sufficient to replace the 1996 Mound employment level of 1,408.

Table 4 also highlights local income taxes returned to the City of Miamisburg by employees who are forecast to work at the Mound. The income tax projections are based on a 1.75% income tax rate using average salaries for each type of space (R&D, industrial, and office). ERA is assuming that average salaries in Options 1, 2, and 3 will increase, in relation to the extent of R&D activity which is projected for the Mound; ERA has assumed 2% annual inflation in salaries through the forecast period. For Option 1, Table 4 indicates that total tax revenue will increase through the year 2000 to about $1.16 million, before falling to $1.02 million in 2005 as DoE employees leave. Option 2 is projected to exhibit a similar pattern of revenue creation, increasing between 1996 and 2000, falling through 2005, and increasing between 2005 and 2010. The third option offers a modest improvement in tax revenue by 2010 compared to Option 1, due an assumption that employees in Option 3 will make higher average salaries.

Payment in Lieu of Taxes

One outgrowth of the decision to create the Mound redevelopment authority, the MMCIC, was a decision to charge future Mound tenants a fee in lieu of property taxes, 60% of which is reallocated to the local school board. The following table highlights projections for the payment in lieu of taxes through the forecast period.

Table 5: Forecast Payments in Lieu of Property Tax

Scenario #	1997	2000	2005	2010
Option 1	$102,740	$183,017	$212,724	$284,293
Option 2	$112,122	$158,003	$180,135	$251,704
Option 3	$59,013	$86,820	$136,052	$192,302

Table 5 shows that Option 1 is projected to have the highest payments, since that Option also incorporates the largest amount of existing space. Alternatives 2 and 3 have lower payments, for the same reason. ERA did not generate projections of tax revenue for the South 40 property due to complete uncertainty about how fees for that property would be structured.

Economic Impact of Delayed Absorption

The financial analysis conducted by ERA highlighted the potential financial impacts of delayed absorption to MMCIC. Reduced absorption will also reduce the economic impacts of Mound redevelopment. The Mound facility

currently has an employment base of roughly 1,400 persons, which includes about 1,050 EG&G employees and 170 DoE employees; the Mound privatization effort has created an additional 190 jobs. Generation of Mound employment forecasts was based on three assumptions, which are as follows:

- First, That EG&G will draw its employment down from a current level of 1,050 to zero in 2005.
- Second, that DoE will leave the Mound entirely in 2005.
- Third, that delayed absorption will occur in 1997, 1998, and 1999, reducing the amount of absorbed space.

ERA based its forecast of private sector jobs on the amount of annual absorption for existing office, industrial, and R&D space, as well as developed land, projected under each option. ERA utilized industry rules-of-thumb for the amount of square feet per employee for industrial, R&D, or office space to generate the employment forecasts. The following table highlights the resulting Mound employment projections.

Table 6: Total Mound Employment and Local Income Taxes Generated by Delayed Absorption

Total Jobs	1996	2000	2005	2010
Option 1	1,408	1,440	1,577	2,143
Option 2	1,408	1,467	1,424	1,990
Option 3	1,408	1,183	1,088	1,375
Income Taxes	**1996**	**2000**	**2005**	**2010**
Option 1	$1,139,635	$1,076,799	$1,029,252	$1,385,471
Option 2	$1,163,400	$1,180,035	$1,107,879	$1,608,188
Option 3	$1,197,350	$1,064,458	$1,031,598	$1,428,411

The table shows that, for Option 1, total employment will increase slowly through 2000 and 2005, rising to 1,577; by 2010, the projections indicate that there will be over 2,000 jobs on the Mound. Option 2 is projected to generate slightly fewer jobs, with total employment rising through 2000, falling by 2005, and then recovering by 2010 to 1,990. Option 3 shows that the number of jobs created between 1996 and 2010 is not sufficient to replace the 1996 Mound employment level of 1,408.

Table 6 also highlights local income taxes returned to the City of Miamisburg by employees who are forecast to work at the Mound. The income tax projections are based on a 1.75% income tax rate using average salaries for each type of space (R&D, industrial, and office). ERA is assuming that average salaries in Options 1, 2, and 3 will increase over the forecast period at an effective rate of 2%, which is reflective of low inflation.

For Option 1, Table 14 indicates that total tax revenue will decrease between 1996 and 2005, falling from $1.139 million to $1.029 million, before increasing to $1.385 million in 2010. Option 2 is projected to exhibit a somewhat different pattern of revenue creation, with revenue growth between 1996 and 2000, followed by declining revenue through 2005. Between 2005 and 2005, Option 2 is projected to generate incremental revenue growth of over $500,000. Option 3 offers a modest improvement in tax revenue by 2010 compared to Option 1, due an assumption that employees in Option 3 will make higher average salaries. In Option 3, tax revenues are projected to decrease between 1996 and 2005, falling from $1.197 million to $1.031 million. The projections indicate that tax revenue will then increase through 2010, growing to roughly $1.428 million.

Payment in Lieu of Taxes

One outgrowth of the decision to create the Mound redevelopment authority (the MMCIC) was an agreement between the City of Miamisburg and the local school board to charge future Mound tenants a fee in lieu of property taxes, 60% of which is reallocated to the local school board. The following table highlights projections for the payment in lieu of taxes through the forecast period, incorporating the delayed absorption assumption for 1997, 1998, and 1999.

Table 7: Forecast Payments in Lieu of Property Tax, with Delayed Absorption

Option #	1997	2000	2005	2010
Option 1	$75,740	$144,767	$214,560	$286,129
Option 2	$77,922	$150,849	$180,135	$251,704
Option 3	$47,313	$81,737	$136,052	$192,302

Table 7 shows that Option 1 is projected to have the highest payments, growing from $75,000 in 1997 to about $286,000 in 2010. Option 2 is forecast to generate a slightly lower overall revenue stream, growing from about $77,900 in 1997 to $251,000 in 2010. Option 3 is forecast to generate the lowest overall revenue stream, growing from about $47,000 in 1997 to $192,000 in 2010. ERA did not generate projections of tax revenue for the South 40 property due to complete uncertainty about how fees for that property would be structured.

Option 1, Iteration 1, Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$812,100	$1,042,100	$1,282,100	$1,460,680	$1,549,499	$1,603,503	$1,635,573	$1,685,030	$1,866,722	$2,055,009	$2,250,083	$2,452,139	$2,620,691	$2,795,004
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,270,367	$1,196,079	$1,049,655	$1,042,896	$852,127	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$2,082,467	$2,238,179	$2,331,755	$2,503,576	$2,401,626	$3,445,511	$2,551,769	$2,621,534	$2,882,077	$3,149,721	$3,424,713	$3,707,299	$3,934,019	$4,167,242
Less: Vacancy & Credit Loss	$468,700	$282,958	$101,262	$71,104	$33,327	$14,432	$14,721	$15,015	$758,895	$634,902	$505,641	$370,957	$276,793	$178,714
Effective Gross Revenue	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$286,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$581,740	$351,201	$125,684	$88,253	$19,220	$8,160	$8,160	$8,160	$404,326	$331,632	$258,936	$186,240	$136,240	$86,240
Total Operating Expenses	$2,102,388	$1,998,553	$1,913,915	$2,031,512	$1,950,698	$1,932,701	$1,930,325	$1,737,872	$1,935,463	$1,657,435	$1,372,009	$1,078,555	$1,018,673	$961,191
Pass-Through Expenses														
Maintenance & Management	$353,881	$454,631	$555,381	$630,393	$655,817	$664,389	$664,389	$676,378	$732,716	$789,054	$845,393	$901,733	$940,483	$979,233
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$32,849	$37,399	$42,209	$46,807	$50,760	$34,732	$58,920	$63,758	$69,915	$76,579	$83,800	$91,634	$99,802	$108,712
Payment in Lieu of Taxes	$102,740	$131,990	$161,240	$183,017	$190,399	$192,887	$192,887	$196,368	$212,724	$229,080	$245,437	$261,793	$273,043	$284,293
Total Pass-Through Expenses	$1,587,958	$1,495,098	$1,312,068	$1,158,773	$896,976	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Site & Facility Refit Costs	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$4,590,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$2,844,710	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,546,639	$2,333,715	$2,332,001	$2,333,429
Total Revenues	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
NOI Before DoE Subsidies	($2,976,580)	($1,538,430)	($995,491)	($757,814)	($479,375)	$586,369	($309,473)	($67,858)	($827,635)	($237,327)	$372,433	$1,002,627	$1,325,225	$1,655,099
DoE Subsidy Begin Balance	$9,000,000	$6,023,420	$4,484,990	$3,489,499	$2,731,685	$2,252,310	$2,252,310	$1,942,837	$1,874,979	$1,047,343	$810,016	$810,016	$810,016	$810,016
DoE Subsidy Utilization	$2,976,580	$1,538,430	$995,491	$757,814	$479,375	$0	$309,473	$67,858	$827,635	$237,327	$0	$0	$0	$0
Subsidy Carry-Over	$6,023,420	$4,484,990	$3,489,499	$2,731,685	$2,252,310	$2,252,310	$1,942,837	$1,874,979	$1,047,343	$810,016	$810,016	$810,016	$810,016	$810,016
Total Revenue	$4,590,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$3,431,079	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Total Expenses	$4,590,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$2,844,710	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,546,639	$2,333,715	$2,332,001	$2,333,429
Net Income/(Loss)	$0	$0	$0	$0	$0	$586,369	$0	$0	$0	$0	$372,433	$1,002,627	$1,325,225	$1,655,099

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,507,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,634,765	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,173,825	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 2, Market Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$812,100	$1,042,100	$1,282,100	$1,460,680	$1,549,499	$1,603,503	$1,635,573	$1,685,030	$1,866,722	$2,055,009	$2,250,083	$2,452,139	$2,620,691	$2,795,004
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,270,367	$1,196,079	$1,049,655	$1,042,896	$852,127	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$2,082,467	$2,238,179	$2,331,755	$2,503,576	$2,401,626	$3,445,511	$2,551,769	$2,621,534	$2,882,077	$3,149,721	$3,424,713	$3,707,299	$3,934,019	$4,167,242
Less: Vacancy & Credit Loss	$468,700	$282,958	$101,262	$71,104	$33,327	$14,432	$14,721	$15,015	$758,895	$634,902	$505,641	$370,957	$276,793	$178,714
Effective Gross Revenue	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$581,740	$351,201	$125,684	$88,253	$19,220	$8,160	$8,160	$8,160	$404,326	$331,632	$258,936	$186,240	$136,240	$86,240
Total Operating Expenses	$1,472,100	$1,156,979	$866,369	$779,502	$673,629	$635,874	$522,478	$512,137	$902,431	$840,927	$779,714	$718,803	$680,898	$643,313
Pass-Through Expenses														
Maintenance & Management	$353,881	$454,631	$555,381	$630,393	$655,817	$664,389	$664,389	$676,378	$732,716	$789,054	$845,393	$901,733	$940,483	$979,233
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$32,849	$37,399	$42,209	$46,807	$50,760	$54,732	$58,920	$63,758	$69,915	$76,579	$83,800	$91,634	$99,802	$108,712
Payment in Lieu of Taxes	$102,740	$131,990	$161,240	$183,017	$190,399	$192,887	$192,887	$196,368	$212,724	$229,080	$245,437	$261,793	$273,043	$284,293
Total Pass-Through Expenses	$1,587,958	$1,495,098	$1,312,068	$1,158,773	$896,976	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Site & Facility Refit Costs	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,960,058	$2,652,077	$2,178,437	$1,938,276	$1,570,604	$1,547,882	$1,438,674	$1,448,640	$1,917,786	$1,935,640	$1,954,344	$1,973,962	$1,994,226	$2,015,551
Total Revenues	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
NOI Before DoE Subsidies	($2,346,292)	($696,857)	$52,055	$494,196	$797,695	$1,883,197	$1,098,374	$1,157,878	$205,397	$579,180	$964,728	$1,362,380	$1,663,000	$1,972,977
DoE Subsidy Begin Balance	$9,000,000	$6,653,708	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852
DoE Subsidy Utilization	$2,346,292	$696,857	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,653,708	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852	$5,956,852
Total Revenue	$3,960,058	$2,652,077	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Total Expenses	$3,960,058	$2,652,077	$2,178,437	$1,938,276	$1,570,604	$1,547,882	$1,438,674	$1,448,640	$1,917,786	$1,935,640	$1,954,344	$1,973,962	$1,994,226	$2,015,551
Net Income/(Loss)	$0	$0	$52,055	$494,196	$797,695	$1,883,197	$1,098,374	$1,157,878	$205,397	$579,180	$964,728	$1,362,380	$1,663,000	$1,972,977

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,507,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$3,634,765	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,173,825	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 3, Market Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$812,100	$1,042,100	$1,282,100	$1,460,680	$1,549,499	$1,603,503	$1,635,573	$1,685,030	$1,866,722	$2,055,009	$2,250,083	$2,452,139	$2,620,691	$2,795,004
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,270,367	$1,196,079	$1,049,655	$1,042,896	$852,127	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$2,082,467	$2,238,179	$2,331,755	$2,503,576	$2,401,626	$3,445,511	$2,551,769	$2,621,534	$2,882,077	$3,149,721	$3,424,713	$3,707,299	$3,934,019	$4,167,242
Less: Vacancy & Credit Loss	$468,700	$282,958	$101,262	$71,104	$33,327	$14,432	$14,721	$15,015	$758,895	$634,902	$505,641	$370,957	$276,793	$178,714
Effective Gross Revenue	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$581,740	$351,201	$125,684	$88,253	$19,220	$8,160	$8,160	$8,160	$404,326	$331,632	$258,936	$186,240	$136,240	$86,240
Total Operating Expenses	$2,102,388	$1,998,553	$1,913,915	$2,031,512	$1,950,698	$1,932,701	$1,930,325	$1,737,872	$1,935,463	$1,657,435	$1,372,009	$1,078,555	$1,018,673	$961,191
Pass-Through Expenses														
Maintenance & Management	$353,881	$454,631	$555,381	$630,393	$655,817	$664,389	$664,389	$676,378	$732,716	$789,054	$845,393	$901,733	$940,483	$979,233
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$32,849	$37,399	$42,209	$46,807	$50,760	$54,732	$58,920	$63,758	$69,915	$76,579	$83,800	$91,634	$99,802	$108,712
Payment in Lieu of Taxes	$102,740	$131,990	$161,240	$183,017	$190,399	$192,887	$192,887	$196,368	$212,724	$229,080	$245,437	$261,793	$273,043	$284,293
Total Pass-Through Expenses	$1,587,958	$1,495,098	$1,312,068	$1,158,773	$896,976	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,690,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$2,844,710	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,546,639	$2,333,715	$2,332,001	$2,333,429
Total Revenues	$1,613,766	$1,955,220	$2,230,492	$2,422,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
NOI Before DoE Subsidies	($2,076,580)	($1,538,430)	($995,491)	($757,814)	($479,375)	$586,369	($309,473)	($67,858)	($827,635)	($237,327)	$372,433	$1,002,627	$1,325,225	$1,655,099
DoE Subsidy Begin Balance	$9,000,000	$6,923,420	$5,384,990	$4,389,499	$3,631,685	$3,152,310	$3,152,310	$2,842,837	$2,774,979	$1,947,343	$1,710,016	$1,710,016	$1,710,016	$1,710,016
DoE Subsidy Utilization	$2,076,580	$1,538,430	$995,491	$757,814	$479,375	$0	$309,473	$67,858	$827,635	$237,327	$0	$0	$0	$0
Subsidy Carry-Over	$6,923,420	$5,384,990	$4,389,499	$3,631,685	$3,152,310	$3,152,310	$2,842,837	$2,774,979	$1,947,343	$1,710,016	$1,710,016	$1,710,016	$1,710,016	$1,710,016
Total Revenue	$3,690,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$3,431,079	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Total Expenses	$3,690,346	$3,493,651	$3,225,984	$3,190,286	$2,847,674	$2,844,710	$2,846,521	$2,674,376	$2,950,818	$2,752,147	$2,546,639	$2,333,715	$2,332,001	$2,333,429
Net Income/(Loss)	$0	$0	$0	$0	$0	$586,369	$0	$0	$0	$0	$372,433	$1,002,627	$1,325,225	$1,655,099

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,732,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,916,015	$97,524	$176,577	$462,688	$44,300	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$29,580,075	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 4, Market Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$812,100	$1,042,100	$1,282,100	$1,460,680	$1,549,499	$1,603,503	$1,635,573	$1,685,030	$1,866,722	$2,055,009	$2,250,083	$2,452,139	$2,620,691	$2,795,004
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,270,367	$1,196,079	$1,049,655	$1,042,896	$852,127	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$2,082,467	$2,238,179	$2,331,755	$2,503,576	$2,401,626	$3,445,511	$2,551,769	$2,621,534	$2,882,077	$3,149,721	$3,424,713	$3,707,299	$3,934,019	$4,167,242
Less: Vacancy & Credit Loss	$468,700	$282,958	$101,262	$71,104	$33,327	$14,432	$14,721	$15,015	$758,895	$634,902	$505,641	$370,957	$276,793	$178,714
Effective Gross Revenue	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$581,740	$351,201	$125,684	$88,253	$19,220	$8,160	$8,160	$8,160	$494,326	$331,632	$258,936	$186,240	$136,240	$86,240
Total Operating Expenses	$1,472,100	$1,156,979	$866,369	$779,502	$673,629	$635,874	$522,478	$512,137	$902,431	$840,927	$779,714	$718,803	$680,898	$643,313
Pass-Through Expenses														
Maintenance & Management	$353,881	$454,631	$555,381	$630,393	$655,817	$664,389	$664,389	$676,378	$732,716	$789,054	$845,393	$901,733	$940,483	$979,233
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$32,849	$37,399	$42,209	$46,807	$50,760	$54,732	$58,920	$63,758	$69,915	$76,579	$83,800	$91,634	$99,802	$108,712
Payment in Lieu of Taxes	$102,740	$131,990	$161,240	$183,017	$190,399	$192,887	$192,887	$196,268	$212,724	$229,080	$245,437	$261,793	$273,043	$284,293
Total Pass-Through Expenses	$1,587,958	$1,495,098	$1,312,068	$1,158,773	$896,976	$912,008	$916,196	$936,504	$1,015,355	$1,094,713	$1,174,630	$1,255,160	$1,313,328	$1,372,238
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,060,058	$2,652,077	$2,178,437	$1,938,276	$1,570,604	$1,547,882	$1,438,674	$1,448,640	$1,917,786	$1,935,640	$1,954,344	$1,973,962	$1,994,226	$2,015,551
Total Revenues	$1,613,766	$1,955,220	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
NOI Before DoE Subsidies	($1,446,292)	($696,857)	$52,055	$494,196	$797,695	$1,883,197	$1,098,374	$1,157,878	$205,397	$579,180	$964,728	$1,362,380	$1,663,000	$1,972,977
DoE Subsidy Begin Balance	$9,000,000	$7,553,708	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852
DoE Subsidy Utilization	$1,446,292	$696,857	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$7,553,708	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852	$6,856,852
Total Revenue	$3,060,058	$2,652,077	$2,230,492	$2,432,472	$2,368,299	$3,431,079	$2,537,048	$2,606,518	$2,123,183	$2,514,820	$2,919,072	$3,336,342	$3,657,226	$3,988,528
Total Expenses	$3,060,058	$2,652,077	$2,178,437	$1,938,276	$1,570,604	$1,547,882	$1,438,674	$1,448,640	$1,917,786	$1,935,640	$1,954,344	$1,973,962	$1,994,226	$2,015,551
Net Income/(Loss)	$0	$0	$52,055	$494,196	$797,695	$1,883,197	$1,098,374	$1,157,878	$205,397	$579,180	$964,728	$1,362,380	$1,663,000	$1,972,977

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,732,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,916,015	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$29,580,075	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 5, Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$602,100	$747,100	$892,100	$1,155,680	$1,376,434	$1,557,026	$1,627,338	$1,698,279	$1,880,236	$2,068,793	$2,264,143	$2,466,480	$2,635,319	$2,809,925
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,172,927	$1,058,039	$871,015	$887,601	$765,059	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,775,027	$1,805,139	$1,763,115	$2,043,281	$2,141,493	$3,378,434	$2,541,666	$2,643,065	$2,903,874	$3,171,788	$3,447,055	$3,729,922	$3,956,929	$4,190,445
Less: Vacancy & Credit Loss	$672,700	$571,958	$475,262	$360,104	$189,901	$50,330	$18,041	$0	$743,579	$619,279	$489,707	$354,703	$260,215	$161,804
Effective Gross Revenue	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$834,940	$709,901	$589,884	$446,953	$109,516	$28,456	$10,000	$0	$396,166	$323,472	$250,776	$178,080	$128,080	$78,080
Total Operating Expenses	$2,355,588	$2,357,253	$2,378,115	$2,390,212	$2,040,994	$1,952,997	$1,932,165	$1,729,712	$1,927,303	$1,649,275	$1,363,849	$1,070,395	$1,010,513	$953,031
Pass-Through Expenses														
Maintenance & Management	$260,881	$322,881	$384,881	$498,643	$585,838	$648,660	$662,963	$682,702	$739,040	$795,378	$851,717	$908,057	$946,807	$985,557
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,049	$34,849	$38,909	$44,257	$49,405	$54,428	$58,892	$63,880	$70,037	$76,701	$83,922	$91,756	$99,924	$108,834
Payment in Lieu of Taxes	$75,740	$93,740	$111,740	$144,767	$170,082	$188,321	$192,473	$198,204	$214,560	$230,916	$247,273	$263,629	$274,879	$286,129
Total Pass-Through Expenses	$1,466,158	$1,322,548	$1,088,768	$986,223	$805,325	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Site & Facility Refit Costs	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$4,721,746	$3,679,801	$3,466,884	$3,376,436	$2,846,319	$2,844,405	$2,846,494	$2,674,498	$2,950,941	$2,752,270	$2,546,761	$2,333,838	$2,332,123	$2,333,551
Total Revenues	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
NOI Before DoE Subsidies	($3,619,420)	($2,446,620)	($2,179,031)	($1,693,259)	($894,727)	$483,699	($322,868)	($31,433)	($790,646)	($199,761)	$410,587	$1,041,381	$1,364,591	$1,695,089
DoE Subsidy Begin Balance	$9,000,000	$5,380,580	$2,933,960	$754,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$3,619,420	$2,446,620	$2,179,031	$754,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$5,380,580	$2,933,960	$754,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$4,721,746	$3,679,801	$3,466,884	$2,438,106	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Total Expenses	$4,721,746	$3,679,801	$3,466,884	$3,376,436	$2,846,319	$2,844,405	$2,846,494	$2,674,498	$2,950,941	$2,752,270	$2,546,761	$2,333,838	$2,332,123	$2,333,551
Net Income/(Loss)	$0	$0	($0)	($938,330)	($894,727)	$483,699	($322,868)	($31,433)	($790,646)	($199,761)	$410,587	$1,041,381	$1,364,591	$1,695,089

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,507,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,634,765	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,173,825	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 6, Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$602,100	$747,100	$892,100	$1,155,680	$1,376,434	$1,557,026	$1,627,338	$1,698,279	$1,880,236	$2,068,793	$2,264,143	$2,466,480	$2,635,319	$2,809,925
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,172,927	$1,058,039	$871,015	$887,601	$765,059	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,775,027	$1,805,139	$1,763,115	$2,043,281	$2,141,493	$3,378,434	$2,541,666	$2,643,065	$2,903,874	$3,171,788	$3,447,055	$3,729,922	$3,956,929	$4,190,445
Less: Vacancy & Credit Loss	$672,700	$571,958	$475,262	$360,104	$189,901	$50,330	$18,041	$0	$743,579	$619,279	$489,707	$354,703	$260,215	$161,804
Effective Gross Revenue	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$834,940	$709,901	$589,884	$446,953	$109,516	$28,456	$10,000	$0	$396,166	$323,472	$250,776	$178,080	$128,080	$78,080
Total Operating Expenses	$1,725,300	$1,515,679	$1,330,569	$1,138,202	$763,925	$656,170	$524,318	$503,977	$894,271	$832,767	$771,554	$710,643	$672,738	$635,153
Pass-Through Expenses														
Maintenance & Management	$260,881	$322,881	$384,881	$498,643	$585,838	$648,660	$662,963	$682,702	$739,040	$795,378	$851,717	$908,057	$946,807	$985,557
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,049	$34,849	$38,909	$44,257	$49,405	$54,428	$58,892	$63,880	$70,037	$76,701	$83,922	$91,756	$99,924	$108,834
Payment in Lieu of Taxes	$75,740	$93,740	$111,740	$144,767	$170,082	$188,321	$192,473	$198,204	$214,560	$230,916	$247,273	$263,629	$274,879	$286,129
Total Pass-Through Expenses	$1,466,158	$1,322,548	$1,088,768	$986,223	$805,325	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Site & Facility Refit Costs	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$4,091,458	$2,838,227	$2,419,337	$2,124,426	$1,569,250	$1,547,578	$1,438,647	$1,448,763	$1,917,908	$1,935,762	$1,954,466	$1,974,085	$1,994,348	$2,015,673
Total Revenues	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
NOI Before DoE Subsidies	($2,989,132)	($1,605,047)	($1,131,485)	($441,249)	$382,342	$1,780,527	$1,084,979	$1,194,302	$242,386	$616,746	$1,002,883	$1,401,134	$1,702,367	$2,012,967
DoE Subsidy Begin Balance	$9,000,000	$6,010,868	$4,405,822	$3,274,337	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088
DoE Subsidy Utilization	$2,989,132	$1,605,047	$1,131,485	$441,249	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,010,868	$4,405,822	$3,274,337	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088	$2,833,088
Total Revenue	$4,091,458	$2,838,227	$2,419,337	$2,124,426	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Total Expenses	$4,091,458	$2,838,227	$2,419,337	$2,124,426	$1,569,250	$1,547,578	$1,438,647	$1,448,763	$1,917,908	$1,935,762	$1,954,466	$1,974,085	$1,994,348	$2,015,673
Net Income/(Loss)	$0	$0	$0	$0	$382,342	$1,780,527	$1,084,979	$1,194,302	$242,386	$616,746	$1,002,883	$1,401,134	$1,702,367	$2,012,967

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,507,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,634,765	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,173,825	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 7, Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$602,100	$747,100	$892,100	$1,155,680	$1,376,434	$1,557,026	$1,627,338	$1,698,279	$1,880,236	$2,068,793	$2,264,143	$2,466,480	$2,635,319	$2,809,925
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,172,927	$1,058,039	$871,015	$887,601	$765,059	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,775,027	$1,805,139	$1,763,115	$2,043,281	$2,141,493	$3,378,434	$2,541,666	$2,643,065	$2,903,874	$3,171,788	$3,447,055	$3,729,922	$3,956,929	$4,190,445
Less: Vacancy & Credit Loss	$672,700	$571,958	$475,262	$360,104	$189,901	$50,330	$18,041	$0	$743,579	$619,279	$489,707	$354,703	$260,215	$161,804
Effective Gross Revenue	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$834,940	$709,901	$589,884	$446,953	$109,516	$28,456	$10,000	$0	$396,166	$323,472	$250,776	$178,080	$128,080	$78,080
Total Operating Expenses	$2,355,588	$2,357,253	$2,378,115	$2,390,212	$2,040,994	$1,952,997	$1,932,165	$1,729,712	$1,927,303	$1,649,275	$1,363,849	$1,070,395	$1,010,513	$953,031
Pass-Through Expenses														
Maintenance & Management	$260,881	$322,881	$384,881	$498,643	$585,838	$643,660	$662,963	$682,702	$739,040	$795,378	$851,717	$908,057	$946,807	$985,557
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,049	$34,849	$38,909	$44,257	$49,405	$54,428	$58,892	$63,880	$70,037	$76,701	$83,922	$91,756	$99,924	$108,834
Payment in Lieu of Taxes	$75,740	$93,740	$111,740	$144,767	$170,082	$188,321	$192,473	$198,204	$214,560	$230,916	$247,273	$263,629	$274,879	$286,129
Total Pass-Through Expenses	$1,466,158	$1,322,548	$1,088,768	$986,223	$805,325	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,821,746	$3,679,801	$3,466,884	$3,376,436	$2,846,319	$2,844,405	$2,846,494	$2,674,498	$2,950,941	$2,752,270	$2,546,761	$2,333,838	$2,332,123	$2,333,551
Total Revenues	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
NOI Before DoE Subsidies	($2,719,420)	($2,446,620)	($2,179,031)	($1,693,259)	($894,727)	$483,699	($322,868)	($31,433)	($790,646)	($199,761)	$410,587	$1,041,381	$1,364,591	$1,695,089
DoE Subsidy Begin Balance	$9,000,000	$6,280,580	$3,833,960	$1,654,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$2,719,420	$2,446,620	$2,179,031	$1,654,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,280,580	$3,833,960	$1,654,929	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$3,821,746	$3,679,801	$3,466,884	$3,338,106	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Total Expenses	$3,821,746	$3,679,801	$3,466,884	$3,376,436	$2,846,319	$2,844,405	$2,846,494	$2,674,498	$2,950,941	$2,752,270	$2,546,761	$2,333,838	$2,332,123	$2,333,551
Net Income/(Loss)	$0	$0	($0)	($38,330)	($894,727)	$483,699	($322,868)	($31,433)	($790,646)	($199,761)	$410,587	$1,041,381	$1,364,591	$1,695,089

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$365,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,732,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,916,015	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$29,580,075	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 1, Iteration 8, Delayed Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$602,100	$747,100	$892,100	$1,155,680	$1,376,434	$1,557,026	$1,627,338	$1,698,279	$1,880,236	$2,068,793	$2,264,143	$2,466,480	$2,635,319	$2,809,925
Land Sales Income	$0	$0	$0	$0	$0	$930,000	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,172,927	$1,058,039	$871,015	$887,601	$765,059	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,775,027	$1,805,139	$1,763,115	$2,043,281	$2,141,493	$3,378,434	$2,541,666	$2,643,065	$2,903,874	$3,171,788	$3,447,055	$3,729,922	$3,956,929	$4,190,445
Less: Vacancy & Credit Loss	$672,700	$571,958	$475,262	$360,104	$189,901	$50,330	$18,041	$0	$743,579	$619,279	$489,707	$354,703	$260,215	$161,804
Effective Gross Revenue	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$834,940	$709,901	$589,884	$446,953	$109,516	$28,456	$10,000	$0	$396,166	$323,472	$250,776	$178,080	$128,080	$78,080
Total Operating Expenses	$1,725,300	$1,515,679	$1,330,569	$1,138,202	$763,925	$656,170	$524,318	$503,977	$894,271	$832,767	$771,554	$710,643	$672,738	$635,153
Pass-Through Expenses														
Maintenance & Management	$260,881	$322,881	$384,881	$498,643	$585,838	$648,660	$662,963	$682,702	$739,040	$795,378	$851,717	$908,057	$946,807	$985,557
Utilities	$1,098,489	$871,079	$553,239	$298,556	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,049	$34,849	$38,909	$44,257	$49,405	$54,428	$58,892	$63,880	$70,037	$76,701	$83,922	$91,756	$99,924	$108,834
Payment in Lieu of Taxes	$75,740	$93,740	$111,740	$144,767	$170,082	$188,321	$192,473	$198,204	$214,560	$230,916	$247,273	$263,629	$274,879	$286,129
Total Pass-Through Expenses	$1,466,158	$1,322,548	$1,088,768	$986,223	$805,325	$891,408	$914,328	$944,786	$1,023,637	$1,102,995	$1,182,912	$1,263,442	$1,321,610	$1,380,520
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,191,458	$2,838,227	$2,419,337	$2,124,426	$1,569,250	$1,547,578	$1,438,647	$1,448,763	$1,917,908	$1,935,762	$1,954,466	$1,974,085	$1,994,348	$2,015,673
Total Revenues	$1,102,326	$1,233,180	$1,287,852	$1,683,177	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
NOI Before DoE Subsidies	($2,089,132)	($1,605,047)	($1,131,485)	($441,249)	$382,342	$1,780,527	$1,084,979	$1,194,302	$242,386	$616,746	$1,002,883	$1,401,134	$1,702,367	$2,012,967
DoE Subsidy Begin Balance	$9,000,000	$6,910,868	$5,305,822	$4,174,337	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088
DoE Subsidy Utilization	$2,089,132	$1,605,047	$1,131,485	$441,249	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,910,868	$5,305,822	$4,174,337	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088	$3,733,088
Total Revenue	$3,191,458	$2,838,227	$2,419,337	$2,124,426	$1,951,592	$3,328,105	$2,523,626	$2,643,065	$2,160,295	$2,552,509	$2,957,349	$3,375,219	$3,696,715	$4,028,641
Total Expenses	$3,191,458	$2,838,227	$2,419,337	$2,124,426	$1,569,250	$1,547,578	$1,438,647	$1,448,763	$1,917,908	$1,935,762	$1,954,466	$1,974,085	$1,994,348	$2,015,673
Net Income/(Loss)	$0	$0	$0	$0	$382,342	$1,780,527	$1,084,979	$1,194,302	$242,386	$616,746	$1,002,883	$1,401,134	$1,702,367	$2,012,967

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$10,231,248	$312,076	$565,045	$1,480,600	$141,768	$0	$0	$108,400	$6,651,053	$0	$0	$0	$0	$0
Facility Demolition	$900,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$4,732,812	$78,019	$141,261	$370,150	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,916,015	$97,524	$176,577	$462,688	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$29,580,075	$487,619	$882,883	$2,313,438	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 1, Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$1,000,080	$1,330,525	$1,391,756	$1,434,341	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,189,375	$1,126,591	$859,270	$726,673	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$2,189,455	$2,457,116	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,587,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$269,677	$15,202	$0	$0	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$291,805	$16,450	$0	$0	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$2,280,063	$2,042,351	$2,113,231	$2,352,459	$1,989,680	$2,449,951	$2,310,915	$2,054,712	$2,317,803	$1,688,777	$2,342,473	$1,912,359	$1,788,739	$1,815,457
Pass-Through Expenses														
Maintenance & Management	$386,198	$503,409	$527,369	$544,233	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$33,475	$38,343	$41,667	$45,140	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment In Lieu of Taxes	$112,122	$146,151	$153,107	$158,003	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,486,719	$1,408,239	$1,074,088	$807,415	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$3,273,438	$3,273,438	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$7,040,219	$6,724,028	$3,187,319	$3,159,874	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Total Revenues	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($5,120,441)	($4,282,114)	($936,293)	($998,860)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166
DoE Subsidy Begin Balance	$9,000,000	$3,879,559	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$5,120,441	$3,879,559	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$3,879,559	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$7,040,219	$6,321,473	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$7,040,219	$6,724,028	$3,187,319	$3,159,874	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Net Income/(Loss)	$0	($402,555)	($936,293)	($998,860)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition														
Site Improvements	$1,550,000													
Parking	$1,025,000													
Utility Upgrade	$3,050,000													
Water & Sewer Upgrade	$675,000													
Road Improvements	$1,500,000													
Design and Contingency	$4,192,517	$78,019	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,240,646	$97,524	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$26,203,231	$487,619	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 2, Market Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$1,000,080	$1,330,525	$1,391,756	$1,434,341	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,189,375	$1,126,591	$859,270	$726,673	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$2,189,455	$2,457,116	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$269,677	$15,202	$0	$0	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$291,805	$16,450	$0	$0	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$1,649,775	$1,200,778	$1,065,685	$1,100,449	$712,611	$1,153,124	$903,068	$828,977	$1,284,771	$872,269	$1,750,178	$1,552,607	$1,450,964	$1,497,579
Pass-Through Expenses														
Maintenance & Management	$386,198	$503,409	$527,369	$544,233	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$33,475	$38,343	$41,667	$45,140	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$112,122	$146,151	$153,107	$158,003	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,486,719	$1,408,239	$1,074,088	$807,415	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$3,273,438	$3,273,438	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$6,409,931	$5,882,454	$2,139,772	$1,907,864	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Total Revenues	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($4,490,153)	($3,440,540)	$111,254	$253,150	$731,605	$458,584	$738,878	$964,532	($91,467)	$784,531	$284,491	$974,291	$1,369,458	$1,727,044
DoE Subsidy Begin Balance	$9,000,000	$4,509,847	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$977,840	$977,840	$977,840	$977,840	$977,840
DoE Subsidy Utilization	$4,490,153	$3,440,540	$0	$0	$0	$0	$0	$0	$91,467	$0	$0	$0	$0	$0
Subsidy Carry-Over	$4,509,847	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$1,069,307	$977,840	$977,840	$977,840	$977,840	$977,840	$977,840
Total Revenue	$6,409,931	$5,882,454	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,153,113	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$6,409,931	$5,882,454	$2,139,772	$1,907,864	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Net Income/(Loss)	$0	$0	$111,254	$253,150	$731,605	$458,584	$738,878	$964,532	$0	$784,531	$284,491	$974,291	$1,369,458	$1,727,044

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition														
Site Improvements	$1,550,000													
Parking	$1,025,000													
Utility Upgrade	$3,050,000													
Water & Sewer Upgrade	$675,000													
Road Improvements	$1,500,000													
Design and Contingency	$4,192,517	$78,019	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,240,646	$97,524	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$26,203,231	$487,619	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 3, Market Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$1,000,080	$1,330,525	$1,391,756	$1,434,341	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,253,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,189,375	$1,126,591	$859,270	$726,673	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$2,189,455	$2,457,116	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$269,677	$15,202	$0	$0	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$291,805	$16,450	$0	$0	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$2,280,063	$2,042,351	$2,113,231	$2,352,459	$1,989,680	$2,449,951	$2,310,915	$2,054,712	$2,317,803	$1,688,777	$2,342,473	$1,912,359	$1,788,739	$1,815,457
Pass-Through Expenses														
Maintenance & Management	$386,198	$503,409	$527,369	$544,233	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$33,475	$38,343	$41,667	$45,140	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$112,122	$146,151	$153,107	$158,003	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,486,719	$1,408,239	$1,074,088	$807,415	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,766,781	$3,450,590	$3,187,319	$3,159,874	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Total Revenues	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($1,847,004)	($1,008,676)	($936,293)	($998,860)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166
DoE Subsidy Begin Balance	$9,000,000	$7,152,996	$6,144,320	$5,208,028	$4,209,168	$3,663,703	$2,825,460	$2,156,491	$1,895,287	$770,788	$738,811	$431,007	$431,007	$431,007
DoE Subsidy Utilization	$1,847,004	$1,008,676	$936,293	$998,860	$545,464	$838,243	$668,969	$261,204	$1,124,499	$31,977	$307,804	$0	$0	$0
Subsidy Carry-Over	$7,152,996	$6,144,320	$5,208,028	$4,209,168	$3,663,703	$2,825,460	$2,156,491	$1,895,287	$770,788	$738,811	$431,007	$431,007	$431,007	$431,007
Total Revenue	$3,766,781	$3,450,590	$3,187,319	$3,159,874	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$3,766,781	$3,450,590	$3,187,319	$3,159,874	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Net Income/(Loss)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$614,538	$1,031,682	$1,409,166

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition	$1,300,000													
Site Improvements	$1,550,000	$1,065,000												
Parking	$1,025,000	$225,000												
Utility Upgrade	$3,050,000	$1,000,000												
Water & Sewer Upgrade	$675,000	$150,000												
Road Improvements	$1,500,000	$450,000												
Design and Contingency	$4,517,517	$800,519	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,646,896	$1,000,649	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,234,481	$5,003,244	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 4, Market Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$1,000,080	$1,330,525	$1,391,756	$1,434,341	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,189,375	$1,126,591	$859,270	$726,673	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$2,189,455	$2,457,116	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$269,677	$15,202	$0	$0	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$291,805	$16,450	$0	$0	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$1,649,775	$1,200,778	$1,065,685	$1,100,449	$712,611	$1,153,124	$903,068	$828,977	$1,284,771	$872,269	$1,750,178	$1,552,607	$1,450,964	$1,497,579
Pass-Through Expenses														
Maintenance & Management	$386,198	$503,409	$527,369	$544,233	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$33,475	$38,343	$41,667	$45,140	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$112,122	$146,151	$153,107	$158,003	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,486,719	$1,408,239	$1,074,088	$807,415	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,136,493	$2,609,017	$2,139,772	$1,907,864	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Total Revenues	$1,919,778	$2,441,914	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($1,216,716)	($167,103)	$111,254	$253,150	$731,605	$458,584	$738,878	$964,532	($91,467)	$784,531	$284,491	$974,291	$1,369,458	$1,727,044
DoE Subsidy Begin Balance	$9,000,000	$7,783,284	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,524,715	$7,524,715	$7,524,715	$7,524,715	$7,524,715
DoE Subsidy Utilization	$1,216,716	$167,103	$0	$0	$0	$0	$0	$0	$91,467	$0	$0	$0	$0	$0
Subsidy Carry-Over	$7,783,284	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,616,182	$7,524,715	$7,524,715	$7,524,715	$7,524,715	$7,524,715	$7,524,715
Total Revenue	$3,136,493	$2,609,017	$2,251,026	$2,161,014	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,153,113	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$3,136,493	$2,609,017	$2,139,772	$1,907,864	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Net Income/(Loss)	$0	$0	$111,254	$253,150	$731,605	$458,584	$738,878	$964,532	$0	$784,531	$284,491	$974,291	$1,369,458	$1,727,044

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition	$1,300,000													
Site Improvements	$1,550,000	$1,065,000												
Parking	$1,025,000	$225,000												
Utility Upgrade	$3,050,000	$1,000,000												
Water & Sewer Upgrade	$675,000	$150,000												
Road Improvements	$1,500,000	$450,000												
Design and Contingency	$4,517,517	$800,519	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,646,896	$1,000,649	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,234,481	$5,003,244	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 5, Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$698,080	$879,610	$1,092,715	$1,372,800	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,065,951	$953,034	$744,132	$697,627	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$1,764,031	$1,832,644	$1,836,847	$2,070,427	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$566,077	$431,995	$276,502	$62,002	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$612,525	$467,441	$299,190	$67,090	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$2,600,783	$2,493,342	$2,412,421	$2,419,549	$1,989,680	$2,449,951	$2,310,915	$2,054,712	$2,317,803	$1,688,777	$2,342,473	$1,912,359	$1,788,739	$1,815,457
Pass-Through Expenses														
Maintenance & Management	$268,398	$337,761	$417,477	$519,591	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,195	$35,137	$39,540	$44,663	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$77,922	$98,060	$121,203	$150,849	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,332,439	$1,191,293	$930,165	$775,142	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$3,273,438	$3,273,438	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$7,206,659	$6,958,073	$3,342,585	$3,194,691	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Total Revenues	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($6,008,705)	($5,557,424)	($1,782,241)	($1,186,265)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166
DoE Subsidy Begin Balance	$9,000,000	$2,991,295	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$6,008,705	$2,991,295	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$2,991,295	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$7,206,659	$4,391,944	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$7,206,659	$6,958,073	$3,342,585	$3,194,691	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Net Income/(Loss)	$0	($2,566,129)	($1,782,241)	($1,186,265)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition														
Site Improvements	$1,550,000													
Parking	$1,025,000													
Utility Upgrade	$3,050,000													
Water & Sewer Upgrade	$675,000													
Road Improvements	$1,500,000													
Design and Contingency	$4,192,517	$78,019	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,240,646	$97,524	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$26,203,231	$487,619	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 6, Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$698,080	$879,610	$1,092,715	$1,372,800	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,065,951	$953,034	$744,132	$697,627	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$1,764,031	$1,832,644	$1,836,847	$2,070,427	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$566,077	$431,995	$276,502	$62,002	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$612,525	$467,441	$299,190	$67,090	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$1,970,495	$1,651,769	$1,364,874	$1,167,539	$712,611	$1,153,124	$903,068	$828,977	$1,284,771	$872,269	$1,750,178	$1,552,607	$1,450,964	$1,497,579
Pass-Through Expenses														
Maintenance & Management	$268,398	$337,761	$417,477	$519,591	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,195	$35,137	$39,540	$44,663	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$77,922	$98,060	$121,203	$150,849	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,332,439	$1,191,293	$930,165	$775,142	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$3,273,438	$3,273,438	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$6,576,371	$6,116,499	$2,295,039	$1,942,681	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Total Revenues	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($5,378,417)	($4,715,850)	($734,695)	$65,745	$731,605	$458,584	$738,878	$964,532	($91,467)	$784,531	$284,491	$974,291	$1,369,458	$1,727,044
DoE Subsidy Begin Balance	$9,000,000	$3,621,583	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$5,378,417	$3,621,583	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$3,621,583	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$6,576,371	$5,022,232	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$6,576,371	$6,116,499	$2,295,039	$1,942,681	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Net Income/(Loss)	$0	($1,094,267)	($734,695)	$65,745	$731,605	$458,584	$738,878	$964,532	($91,467)	$784,531	$284,491	$974,291	$1,369,458	$1,727,044

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$385,225	$141,768			$108,400	$6,651,053					
Facility Demolition														
Site Improvements	$1,550,000													
Parking	$1,025,000													
Utility Upgrade	$3,050,000													
Water & Sewer Upgrade	$675,000													
Road Improvements	$1,500,000													
Design and Contingency	$4,192,517	$78,019	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,240,646	$97,524	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$26,203,231	$487,619	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 7, Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$698,080	$879,610	$1,092,715	$1,372,800	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,065,951	$953,034	$744,132	$697,627	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$1,764,031	$1,832,644	$1,836,847	$2,070,427	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$566,077	$431,995	$276,502	$62,002	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$612,525	$467,441	$299,190	$67,090	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$2,600,783	$2,493,342	$2,412,421	$2,419,549	$1,989,680	$2,449,951	$2,310,915	$2,054,712	$2,317,803	$1,688,777	$2,342,473	$1,912,359	$1,788,739	$1,815,457
Pass-Through Expenses														
Maintenance & Management	$268,398	$337,761	$417,477	$519,591	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,195	$35,137	$39,540	$44,663	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$77,922	$98,060	$121,203	$150,849	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,332,439	$1,191,293	$930,165	$775,142	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,933,221	$3,684,635	$3,342,585	$3,194,691	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Total Revenues	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($2,735,268)	($2,283,986)	($1,782,241)	($1,186,265)	($545,464)	($838,243)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166
DoE Subsidy Begin Balance	$9,000,000	$6,264,732	$3,980,746	$2,198,505	$1,012,240	$466,776	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$2,735,268	$2,283,986	$1,782,241	$1,186,265	$545,464	$466,776	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,264,732	$3,980,746	$2,198,505	$1,012,240	$466,776	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$3,933,221	$3,684,635	$3,342,585	$3,194,691	$2,750,869	$2,843,479	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$3,933,221	$3,684,635	$3,342,585	$3,194,691	$2,750,869	$3,214,947	$3,080,099	$2,844,203	$3,186,146	$2,636,477	$3,370,090	$3,020,507	$2,955,054	$3,040,682
Net Income/(Loss)	$0	$0	$0	$0	$0	($371,468)	($668,969)	($261,204)	($1,124,499)	($31,977)	($307,804)	$614,538	$1,031,682	$1,409,166

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition	$1,300,000													
Site Improvements	$1,550,000	$1,065,000												
Parking	$1,025,000	$225,000												
Utility Upgrade	$3,050,000	$1,000,000												
Water & Sewer Upgrade	$675,000	$150,000												
Road Improvements	$1,500,000	$450,000												
Design and Contingency	$4,517,517	$800,319	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,682,763	$0	$0	$0	$0	$0
Soft Costs	$5,646,896	$1,000,649	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,234,481	$5,003,244	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 2, Iteration 8, Delayed Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$698,080	$879,610	$1,092,715	$1,372,800	$1,482,275	$1,511,921	$1,542,159	$1,593,934	$1,806,398	$2,026,722	$2,255,143	$2,491,889	$2,676,175	$2,866,835
Land Sales Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Expense Pass-Through	$1,065,951	$953,034	$744,132	$697,627	$723,130	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Joint Venture Income	$0	$0	$0	$0	$0	$99,787	$99,787	$199,574	$199,574	$299,362	$299,362	$399,149	$399,149	$498,936
Total Gross Revenue	$1,764,031	$1,832,644	$1,836,847	$2,070,427	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,874,314	$3,273,784	$3,582,122	$3,999,186	$4,241,639	$4,590,997
Less: Vacancy & Credit Loss	$566,077	$431,995	$276,502	$62,002	$0	$0	$0	$0	$812,668	$669,284	$519,836	$364,141	$254,902	$141,149
Effective Gross Revenue	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$467,610	$378,550	$325,000	$409,200	$58,202	$525,410	$388,750	$325,000	$409,200	$58,202	$997,324	$860,664	$796,926	$881,126
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$612,525	$467,441	$299,190	$67,090	$0	$0	$0	$0	$377,466	$304,772	$232,076	$159,380	$109,380	$59,380
Total Operating Expenses	$1,970,495	$1,651,769	$1,364,874	$1,167,539	$712,611	$1,153,124	$903,068	$828,977	$1,284,771	$872,269	$1,750,178	$1,552,607	$1,450,964	$1,497,579
Pass-Through Expenses														
Maintenance & Management	$268,398	$337,761	$417,477	$519,591	$552,138	$552,138	$552,138	$564,127	$620,465	$676,803	$733,142	$789,482	$828,232	$866,982
Utilities	$954,924	$720,336	$351,944	$60,039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$31,195	$35,137	$39,540	$44,663	$48,753	$52,560	$56,747	$61,585	$67,742	$74,406	$81,627	$89,461	$97,629	$106,539
Payment in Lieu of Taxes	$77,922	$98,060	$121,203	$150,849	$160,298	$160,298	$160,298	$163,779	$180,135	$196,491	$212,848	$229,204	$240,454	$251,704
Total Pass-Through Expenses	$1,332,439	$1,191,293	$930,165	$775,142	$761,189	$764,996	$769,183	$789,491	$868,342	$947,700	$1,027,617	$1,108,147	$1,166,315	$1,225,225
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,302,933	$2,843,062	$2,295,039	$1,942,681	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Total Revenues	$1,197,954	$1,400,649	$1,560,345	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,061,646	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
NOI Before DoE Subsidies	($2,104,980)	($1,442,413)	($734,695)	$65,745	$731,605	$458,584	$738,878	$964,532	($91,467)	$784,531	$284,491	$974,291	$1,369,458	$1,727,044
DoE Subsidy Begin Balance	$9,000,000	$6,895,020	$5,452,608	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,626,446	$4,626,446	$4,626,446	$4,626,446	$4,626,446
DoE Subsidy Utilization	$2,104,980	$1,442,413	$734,695	$0	$0	$0	$0	$0	$91,467	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,895,020	$5,452,608	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,717,913	$4,626,446	$4,626,446	$4,626,446	$4,626,446	$4,626,446	$4,626,446
Total Revenue	$3,302,933	$2,843,062	$2,295,039	$2,008,425	$2,205,405	$2,376,704	$2,411,130	$2,583,000	$2,153,113	$2,604,500	$3,062,286	$3,635,044	$3,986,737	$4,449,848
Total Expenses	$3,302,933	$2,843,062	$2,295,039	$1,942,681	$1,473,800	$1,918,120	$1,672,252	$1,618,468	$2,153,113	$1,819,969	$2,777,795	$2,660,754	$2,617,279	$2,722,804
Net Income/(Loss)	$0	$0	$0	$65,745	$731,605	$458,584	$738,878	$964,532	$0	$784,531	$284,491	$974,291	$1,369,458	$1,727,044

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$8,970,068	$312,076	$565,345	$365,225	$141,768			$108,400	$6,651,053					
Facility Demolition	$1,300,000													
Site Improvements	$1,550,000	$1,065,000												
Parking	$1,025,000	$225,000												
Utility Upgrade	$3,050,000	$1,000,000												
Water & Sewer Upgrade	$675,000	$150,000												
Road Improvements	$1,500,000	$450,000												
Design and Contingency	$4,517,517	$800,519	$141,336	$91,306	$35,442	$0	$0	$27,100	$1,662,763	$0	$0	$0	$0	$0
Soft Costs	$5,646,896	$1,000,649	$176,670	$114,133	$44,303	$0	$0	$33,875	$2,078,454	$0	$0	$0	$0	$0
Total Infrastructure Costs	$28,234,481	$5,003,244	$883,352	$570,664	$221,513	$0	$0	$169,375	$10,392,270	$0	$0	$0	$0	$0

Option 3, Iteration 1, Market Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$614,560	$742,050	$867,050	$923,525	$1,049,198	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$799,627	$760,357	$612,510	$564,681	$458,414	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,414,187	$1,502,407	$1,479,560	$1,488,206	$1,507,612	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$460,385	$413,644	$354,508	$332,860	$227,317	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$300,000	$305,976	$100,000	$689,740	$404,080	$400,000	$631,106	$100,000	$1,009,740	$724,080	$720,000	$951,106	$454,705	$740,180
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$441,551	$396,722	$340,005	$319,243	$101,300	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$2,262,199	$2,350,050	$2,228,237	$2,952,242	$2,436,858	$2,375,841	$2,553,271	$1,829,712	$2,893,947	$2,352,953	$2,086,143	$2,046,491	$1,490,208	$1,718,201
Pass-Through Expenses														
Maintenance & Management	$203,267	$242,789	$281,539	$299,046	$339,377	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,934	$33,299	$36,909	$40,394	$44,635	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$59,013	$70,487	$81,737	$86,820	$98,529	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$999,533	$950,446	$765,637	$627,423	$482,541	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$12,027,344	$12,027,344	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$15,289,076	$15,327,839	$2,993,874	$3,579,665	$2,919,399	$2,912,939	$3,146,626	$2,443,375	$3,563,427	$3,078,755	$2,868,827	$2,886,669	$2,388,553	$2,675,456
Total Revenues	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($14,335,275)	($14,239,077)	($1,868,822)	($2,424,320)	($1,639,105)	($1,259,039)	($1,225,217)	($389,979)	($2,206,209)	($1,326,811)	($830,738)	($430,638)	$377,609	$533,437
DoE Subsidy Begin Balance	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$9,953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$15,289,076	$15,327,839	$2,993,874	$3,579,665	$2,919,399	$2,912,939	$3,146,626	$2,443,375	$3,563,427	$3,078,755	$2,868,827	$2,886,669	$2,388,553	$2,675,456
Net Income/(Loss)	($5,335,275)	($14,239,077)	($1,868,822)	($2,424,320)	($1,639,105)	($1,259,039)	($1,225,217)	($389,979)	($2,206,209)	($1,326,811)	($830,738)	($430,638)	$377,609	$533,437

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$101,219	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$126,524	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$632,619	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 2, Market Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$614,560	$742,050	$867,050	$923,525	$1,049,198	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$799,627	$760,357	$612,510	$564,681	$458,414	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,414,187	$1,502,407	$1,479,560	$1,488,206	$1,507,612	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$460,385	$413,644	$354,508	$332,860	$227,317	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$300,000	$305,976	$100,000	$689,740	$404,080	$400,000	$631,106	$100,000	$1,009,740	$724,080	$720,000	$951,106	$454,705	$740,180
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$441,551	$396,722	$340,005	$319,243	$101,300	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$1,631,911	$1,508,476	$1,180,690	$1,700,232	$1,159,789	$1,079,014	$1,145,424	$603,977	$1,860,915	$1,536,445	$1,493,848	$1,686,739	$1,152,433	$1,400,323
Pass-Through Expenses														
Maintenance & Management	$203,267	$242,789	$281,539	$299,046	$339,377	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,934	$33,299	$36,909	$40,394	$44,635	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$59,013	$70,487	$81,737	$86,820	$98,529	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$999,533	$950,446	$765,637	$627,423	$482,541	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$12,027,344	$12,027,344	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$14,658,788	$14,486,266	$1,946,328	$2,327,655	$1,642,330	$1,616,112	$1,738,779	$1,217,639	$2,530,395	$2,262,248	$2,276,531	$2,526,916	$2,050,778	$2,357,578
Total Revenues	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($13,704,987)	($13,397,503)	($821,276)	($1,172,310)	($362,035)	$37,788	$182,630	$835,756	($1,173,177)	($510,304)	($238,443)	($70,885)	$715,385	$851,314
DoE Subsidy Begin Balance	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$9,953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$14,658,788	$14,486,266	$1,946,328	$2,327,655	$1,642,330	$1,616,112	$1,738,779	$1,217,639	$2,530,395	$2,262,248	$2,276,531	$2,526,916	$2,050,778	$2,357,578
Net Income/(Loss)	($4,704,987)	($13,397,503)	($821,276)	($1,172,310)	($362,035)	$37,788	$182,630	$835,756	($1,173,177)	($510,304)	($238,443)	($70,885)	$715,385	$851,314

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$101,219	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$126,524	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$632,619	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 3, Market Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$614,560	$742,050	$867,050	$923,525	$1,049,198	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$799,627	$760,357	$612,510	$564,681	$458,414	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,414,187	$1,502,407	$1,479,560	$1,488,206	$1,507,612	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$460,385	$413,644	$354,508	$332,860	$227,317	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$300,000	$305,976	$100,000	$689,740	$404,080	$400,000	$631,106	$100,000	$1,009,740	$724,080	$720,000	$951,106	$454,705	$740,180
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$441,551	$396,722	$340,005	$319,243	$101,300	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$2,262,199	$2,350,050	$2,228,237	$2,952,242	$2,436,858	$2,375,841	$2,553,271	$1,829,712	$2,893,947	$2,352,953	$2,086,143	$2,046,491	$1,490,208	$1,718,201
Pass-Through Expenses														
Maintenance & Management	$203,267	$242,789	$281,539	$299,046	$339,377	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,934	$33,299	$36,909	$40,394	$44,635	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$59,013	$70,487	$81,737	$86,820	$98,529	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$999,533	$950,446	$765,637	$627,423	$482,541	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,261,732	$3,300,496	$2,993,874	$3,579,665	$2,919,399	$2,912,939	$3,146,626	$2,443,375	$3,563,427	$3,078,755	$2,868,827	$2,886,669	$2,388,553	$2,675,456
Total Revenues	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($2,307,931)	($2,211,733)	($1,868,822)	($2,424,320)	($1,639,105)	($1,259,039)	($1,225,217)	($389,979)	($2,206,209)	($1,326,811)	($830,738)	($430,638)	$377,609	$533,437
DoE Subsidy Begin Balance	$9,000,000	$6,692,069	$4,480,336	$2,611,514	$187,194	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$2,307,931	$2,211,733	$1,868,822	$2,424,320	$187,194	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,692,069	$4,480,336	$2,611,514	$187,194	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$3,261,732	$3,300,496	$2,993,874	$3,579,665	$1,467,489	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$3,261,732	$3,300,496	$2,993,874	$3,579,665	$2,919,399	$2,912,939	$3,146,626	$2,443,375	$3,563,427	$3,078,755	$2,868,827	$2,886,669	$2,388,553	$2,675,456
Net Income/(Loss)	$0	$0	$0	$0	($1,451,911)	($1,259,039)	($1,225,217)	($389,979)	($2,206,209)	($1,326,811)	($830,738)	($430,638)	$377,609	$533,437

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition		$2,700,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$4,145,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000	$1,725,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000	$2,025,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$1,675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000	$3,125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$3,949,969	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$4,937,461	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$24,687,306	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 4, Market Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$614,560	$742,050	$867,050	$923,525	$1,049,198	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$799,627	$760,357	$612,510	$564,681	$458,414	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,414,187	$1,502,407	$1,479,560	$1,488,206	$1,507,612	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$460,385	$413,644	$354,508	$332,860	$227,317	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$300,000	$305,976	$100,000	$689,740	$404,080	$400,000	$631,106	$100,000	$1,009,740	$724,080	$720,000	$951,106	$454,705	$740,180
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$441,551	$396,722	$340,005	$319,243	$101,300	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$1,631,911	$1,508,476	$1,180,690	$1,700,232	$1,159,789	$1,079,014	$1,145,424	$603,977	$1,860,915	$1,536,445	$1,493,848	$1,686,739	$1,152,433	$1,400,323
Pass-Through Expenses														
Maintenance & Management	$203,267	$242,789	$281,539	$299,046	$339,377	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,934	$33,299	$36,909	$40,394	$44,635	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$59,013	$70,487	$81,737	$86,820	$98,529	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$999,533	$950,446	$765,637	$627,423	$482,541	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$2,631,444	$2,458,922	$1,946,328	$2,327,655	$1,642,330	$1,616,112	$1,738,779	$1,217,639	$2,530,395	$2,262,248	$2,276,531	$2,526,916	$2,050,778	$2,357,578
Total Revenues	$953,801	$1,088,763	$1,125,052	$1,155,346	$1,280,294	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($1,677,643)	($1,370,159)	($821,276)	($1,172,310)	($362,035)	$37,788	$182,630	$835,756	($1,173,177)	($510,304)	($238,443)	($70,885)	$715,385	$851,314
DoE Subsidy Begin Balance	$9,000,000	$7,322,357	$5,952,198	$5,130,922	$3,958,612	$3,596,577	$3,596,577	$3,596,577	$3,596,577	$2,423,400	$1,913,097	$1,674,654	$1,603,769	$1,603,769
DoE Subsidy Utilization	$1,677,643	$1,370,159	$821,276	$1,172,310	$362,035	$0	$0	$0	$1,173,177	$510,304	$238,443	$70,885	$0	$0
Subsidy Carry-Over	$7,322,357	$5,952,198	$5,130,922	$3,958,612	$3,596,577	$3,596,577	$3,596,577	$3,596,577	$2,423,400	$1,913,097	$1,674,654	$1,603,769	$1,603,769	$1,603,769
Total Revenue	$2,631,444	$2,458,922	$1,946,328	$2,327,655	$1,642,330	$1,653,900	$1,921,409	$2,053,396	$2,530,395	$2,262,248	$2,276,531	$2,526,916	$2,766,163	$3,208,893
Total Expenses	$2,631,444	$2,458,922	$1,946,328	$2,327,655	$1,642,330	$1,616,112	$1,738,779	$1,217,639	$2,530,395	$2,262,248	$2,276,531	$2,526,916	$2,050,778	$2,357,578
Net Income/(Loss)	$0	$0	$0	$0	$0	$37,788	$182,630	$835,756	$0	$0	$0	$0	$715,385	$851,314

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition		$2,700,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$4,145,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000	$1,725,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000	$2,025,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$1,675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000	$3,125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$3,949,969	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$4,937,461	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$24,687,306	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 5, Delayed Absorption, MMCIC Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$484,560	$544,560	$604,560	$867,050	$1,043,996	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$757,403	$696,212	$527,253	$544,045	$456,447	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,241,963	$1,240,772	$1,131,813	$1,411,095	$1,500,443	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$574,785	$587,435	$585,499	$382,558	$231,895	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$144,000	$144,000	$144,000	$1,074,536	$289,180	$248,080	$469,130	$144,000	$1,394,536	$609,180	$568,080	$789,130	$498,705	$1,124,976
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,322	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$551,271	$563,404	$561,547	$366,908	$103,340	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$2,215,919	$2,354,755	$2,493,778	$3,384,703	$2,323,998	$2,223,921	$2,391,295	$1,873,712	$3,278,743	$2,238,053	$1,934,223	$1,884,515	$1,534,208	$2,102,997
Pass-Through Expenses														
Maintenance & Management	$162,967	$181,567	$200,167	$281,539	$337,796	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,154	$32,114	$35,334	$40,055	$44,605	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$47,313	$52,713	$58,113	$81,737	$98,070	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$946,753	$870,265	$659,066	$604,494	$480,471	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$12,027,344	$12,027,344	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$15,190,016	$15,252,364	$3,152,845	$3,989,197	$2,804,469	$2,761,019	$2,984,650	$2,487,375	$3,948,223	$2,963,855	$2,716,907	$2,724,693	$2,432,553	$3,060,252
Total Revenues	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($14,522,839)	($14,599,027)	($2,606,531)	($2,960,661)	($1,535,921)	($1,107,119)	($1,063,241)	($433,979)	($2,591,005)	($1,211,911)	($678,818)	($268,662)	$333,609	$148,641
DoE Subsidy Begin Balance	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$9,667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$15,190,016	$15,252,364	$3,152,845	$3,989,197	$2,804,469	$2,761,019	$2,984,650	$2,487,375	$3,948,223	$2,963,855	$2,716,907	$2,724,693	$2,432,553	$3,060,252
Net Income/(Loss)	($5,522,839)	($14,599,027)	($2,606,531)	($2,960,661)	($1,535,921)	($1,107,119)	($1,063,241)	($433,979)	($2,591,005)	($1,211,911)	($678,818)	($268,662)	$333,609	$148,641

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition	-		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$101,219	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$126,524	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$632,619	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 6, Delayed Absorption, Low Operating Costs, and Split Infrastructure Costs

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$484,560	$544,560	$604,560	$867,050	$1,043,996	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$757,403	$696,212	$527,253	$544,045	$456,447	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,241,963	$1,240,772	$1,131,813	$1,411,095	$1,500,443	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$574,785	$587,435	$585,499	$382,558	$231,895	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$144,000	$144,000	$144,000	$1,074,536	$289,180	$248,080	$469,130	$144,000	$1,394,536	$609,180	$568,080	$789,130	$498,705	$1,124,976
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$551,271	$563,404	$561,547	$366,908	$103,340	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$1,585,631	$1,513,182	$1,446,232	$2,132,693	$1,046,929	$927,094	$983,448	$647,977	$2,245,711	$1,421,545	$1,341,928	$1,524,763	$1,196,433	$1,785,119
Pass-Through Expenses														
Maintenance & Management	$162,967	$181,567	$200,167	$281,539	$337,796	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,154	$32,114	$35,334	$40,055	$44,605	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$47,313	$52,713	$58,113	$81,737	$98,070	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$946,753	$870,265	$659,066	$604,494	$480,471	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$12,027,344	$12,027,344	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$14,559,728	$14,410,790	$2,105,298	$2,737,187	$1,527,399	$1,464,192	$1,576,803	$1,261,639	$2,915,191	$2,147,348	$2,124,611	$2,364,940	$2,094,778	$2,742,374
Total Revenues	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($13,892,551)	($13,757,454)	($1,558,984)	($1,708,651)	($258,852)	$189,708	$344,606	$791,756	($1,557,973)	($395,404)	($86,523)	$91,091	$671,385	$466,518
DoE Subsidy Begin Balance	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$9,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$9,667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$14,559,728	$14,410,790	$2,105,298	$2,737,187	$1,527,399	$1,464,192	$1,576,803	$1,261,639	$2,915,191	$2,147,348	$2,124,611	$2,364,940	$2,094,778	$2,742,374
Net Income/(Loss)	($4,892,551)	($13,757,454)	($1,558,984)	($1,708,651)	($258,852)	$189,708	$344,606	$791,756	($1,557,973)	($395,404)	($86,523)	$91,091	$671,385	$466,518

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$101,219	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$126,524	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$632,619	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 7, Delayed Absorption, MMCIC Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$484,560	$544,560	$604,560	$867,050	$1,043,996	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$757,403	$696,212	$527,253	$544,045	$456,447	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,241,963	$1,240,772	$1,131,813	$1,411,095	$1,500,443	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$574,785	$587,435	$585,499	$382,558	$231,895	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$577,935	$727,556	$885,634	$1,052,542	$1,084,118	$1,116,642	$1,150,141	$1,026,693	$894,802	$754,074	$604,097	$444,443	$457,776	$471,509
Tenant Improvement Allowance	$144,000	$144,000	$144,000	$1,074,536	$289,180	$248,080	$469,130	$144,000	$1,394,536	$609,180	$568,080	$789,130	$498,705	$1,124,976
Administrative	$160,713	$200,356	$240,712	$281,783	$287,141	$292,498	$297,855	$266,784	$234,998	$202,498	$169,284	$135,356	$137,142	$138,927
Marketing	$92,000	$84,640	$77,869	$71,639	$65,908	$60,636	$55,785	$51,323	$47,216	$43,439	$39,964	$36,767	$33,825	$31,119
Professional Services	$690,000	$634,800	$584,016	$537,295	$494,311	$454,766	$418,385	$384,914	$354,121	$325,791	$299,728	$275,750	$253,690	$233,395
Space Carrying Costs	$551,271	$563,404	$561,547	$366,908	$103,340	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$2,215,919	$2,354,755	$2,493,778	$3,384,703	$2,323,998	$2,223,921	$2,391,295	$1,873,712	$3,278,743	$2,238,053	$1,934,223	$1,884,515	$1,534,208	$2,102,997
Pass-Through Expenses														
Maintenance & Management	$162,967	$181,567	$200,167	$281,539	$337,796	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,154	$32,114	$35,334	$40,055	$44,605	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$47,313	$52,713	$58,113	$81,737	$98,070	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$946,753	$870,265	$659,066	$604,494	$480,471	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$3,162,672	$3,225,020	$3,152,845	$3,989,197	$2,804,469	$2,761,019	$2,984,650	$2,487,375	$3,948,223	$2,963,855	$2,716,907	$2,724,693	$2,432,553	$3,060,252
Total Revenues	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($2,495,495)	($2,571,683)	($2,606,531)	($2,960,661)	($1,535,921)	($1,107,119)	($1,063,241)	($433,979)	($2,591,005)	($1,211,911)	($678,818)	($268,662)	$333,609	$148,641
DoE Subsidy Begin Balance	$9,000,000	$6,504,505	$3,932,821	$1,326,291	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DoE Subsidy Utilization	$2,495,495	$2,571,683	$2,606,531	$1,326,291	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subsidy Carry-Over	$6,504,505	$3,932,821	$1,326,291	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$3,162,672	$3,225,020	$3,152,845	$2,354,827	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$3,162,672	$3,225,020	$3,152,845	$3,989,197	$2,804,469	$2,761,019	$2,984,650	$2,487,375	$3,948,223	$2,963,855	$2,716,907	$2,724,693	$2,432,553	$3,060,252
Net Income/(Loss)	$0	$0	$0	($1,634,370)	($1,535,921)	($1,107,119)	($1,063,241)	($433,979)	($2,591,005)	($1,211,911)	($678,818)	($268,662)	$333,609	$148,641

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition		$2,700,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$4,145,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000	$1,725,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000	$2,025,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$1,675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000	$3,125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$3,949,969	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$4,937,461	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$24,687,306	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

Option 3, Iteration 8, Delayed Absorption, Low Operating Costs, and Combined Infrastructure

Gross Revenues	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lease Income	$484,560	$544,560	$604,560	$867,050	$1,043,996	$1,174,221	$1,328,054	$1,379,733	$1,545,338	$1,717,015	$1,894,941	$2,079,297	$2,270,270	$2,468,049
Land Sales Income	$0	$0	$0	$0	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000	$0	$60,000
Expense Pass-Through	$757,403	$696,212	$527,253	$544,045	$456,447	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Other Income	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Gross Revenue	$1,241,963	$1,240,772	$1,131,813	$1,411,095	$1,500,443	$1,771,319	$1,921,409	$2,053,396	$2,214,817	$2,502,818	$2,677,624	$2,979,474	$3,168,615	$3,485,304
Less: Vacancy & Credit Loss	$574,785	$587,435	$585,499	$382,558	$231,895	$117,420	$0	$0	$857,599	$750,873	$639,535	$523,444	$402,452	$276,412
Effective Gross Revenue	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Operating Expenses														
MMCIC - Salaries & Benefits	$321,075	$330,707	$340,628	$350,847	$361,373	$372,214	$306,704	$315,905	$325,383	$335,144	$345,198	$355,554	$366,221	$377,208
Tenant Improvement Allowance	$144,000	$144,000	$144,000	$1,074,536	$289,180	$248,080	$469,130	$144,000	$1,394,536	$609,180	$568,080	$789,130	$498,705	$1,124,976
Administrative	$89,285	$91,071	$92,856	$94,642	$96,428	$98,214	$81,785	$83,214	$84,642	$86,071	$87,499	$88,928	$90,356	$91,785
Marketing	$80,000	$64,000	$51,200	$40,960	$32,768	$26,214	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972	$20,972
Professional Services	$400,000	$320,000	$256,000	$204,800	$163,840	$131,072	$104,858	$83,886	$67,109	$67,109	$67,109	$67,109	$67,109	$67,109
Space Carrying Costs	$551,271	$563,404	$561,547	$366,908	$103,340	$51,300	$0	$0	$353,070	$303,070	$253,070	$203,070	$153,070	$103,070
Total Operating Expenses	$1,585,631	$1,513,182	$1,446,232	$2,132,693	$1,046,929	$927,094	$983,448	$647,977	$2,245,711	$1,421,545	$1,341,928	$1,524,763	$1,196,433	$1,785,119
Pass-Through Expenses														
Maintenance & Management	$162,967	$181,567	$200,167	$281,539	$337,796	$378,127	$417,885	$429,874	$468,624	$507,374	$546,124	$584,874	$623,624	$662,374
Utilities	$707,319	$603,871	$365,452	$201,163	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$29,154	$32,114	$35,234	$40,055	$44,605	$49,192	$54,149	$58,987	$64,803	$71,127	$78,007	$85,501	$93,669	$102,579
Payment in Lieu of Taxes	$47,313	$52,713	$58,113	$81,737	$98,070	$109,779	$121,321	$124,802	$136,052	$147,302	$158,552	$169,802	$181,052	$192,302
Total Pass-Through Expenses	$946,753	$870,265	$659,066	$604,494	$480,471	$537,098	$593,355	$613,663	$669,479	$725,803	$782,683	$840,177	$898,345	$957,255
Site & Facility Refit Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	$2,532,384	$2,383,447	$2,105,298	$2,737,187	$1,527,399	$1,464,192	$1,576,803	$1,261,639	$2,915,191	$2,147,348	$2,124,611	$2,364,940	$2,094,778	$2,742,374
Total Revenues	$667,177	$653,337	$546,314	$1,028,537	$1,268,548	$1,653,900	$1,921,409	$2,053,396	$1,357,218	$1,751,944	$2,038,089	$2,456,031	$2,766,163	$3,208,893
NOI Before DoE Subsidies	($1,865,207)	($1,730,110)	($1,558,984)	($1,708,651)	($258,852)	$189,708	$344,606	$791,756	($1,557,973)	($395,404)	($86,523)	$91,091	$671,385	$466,518
DoE Subsidy Begin Balance	$9,000,000	$7,134,793	$5,404,683	$3,845,699	$2,137,048	$1,878,196	$1,878,196	$1,878,196	$1,878,196	$320,224	$0	$0	$0	$0
DoE Subsidy Utilization	$1,865,207	$1,730,110	$1,558,984	$1,708,651	$258,852	$0	$0	$0	$1,557,973	$320,224	$0	$0	$0	$0
Subsidy Carry-Over	$7,134,793	$5,404,683	$3,845,699	$2,137,048	$1,878,196	$1,878,196	$1,878,196	$1,878,196	$320,224	$0	$0	$0	$0	$0
Total Revenue	$2,532,384	$2,383,447	$2,105,298	$2,737,187	$1,527,399	$1,653,900	$1,921,409	$2,053,396	$2,915,191	$2,072,168	$2,038,089	$2,456,031	$2,766,163	$3,208,893
Total Expenses	$2,532,384	$2,383,447	$2,105,298	$2,737,187	$1,527,399	$1,464,192	$1,576,803	$1,261,639	$2,915,191	$2,147,348	$2,124,611	$2,364,940	$2,094,778	$2,742,374
Net Income/(Loss)	$0	$0	$0	$0	$0	$189,708	$344,606	$791,756	$0	($75,180)	($86,523)	$91,091	$671,385	$466,518

Infrastructure Costs for Site and Existing Facility Improvement

Building Code Refit	$5,590,697	$404,876	$436,340	$272,425	$38,384	$0	$0	$108,400	$5,678,194	$0	$0	$0	$0	$0
Facility Demolition		$2,700,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Site Improvements	$1,550,000	$4,145,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parking	$1,025,000	$1,725,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utility Upgrade	$3,050,000	$2,025,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water & Sewer Upgrade	$675,000	$1,675,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Road Improvements	$1,500,000	$3,125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Design and Contingency	$3,347,674	$3,949,969	$109,085	$68,106	$9,596	$0	$0	$27,100	$1,419,549	$0	$0	$0	$0	$0
Soft Costs	$4,184,593	$4,937,461	$136,356	$85,133	$11,995	$0	$0	$33,875	$1,774,436	$0	$0	$0	$0	$0
Total Infrastructure Costs	$20,922,964	$24,687,306	$681,781	$425,664	$59,975	$0	$0	$169,375	$8,872,178	$0	$0	$0	$0	$0

6. EVALUATION OF OPTIONS

The following summarizes the pros and cons of each option from the point of view of each interest group. All options assume that the DoE will complete an environmentally safe closure and will transfer the property to MMCIC and the community in a condition that will permit an economically viable reuse.

Option 1

Community

- An environmentally safe closure is assumed.
- While environmentally safe, the lack of investment in amenities will limit the extent to which is will be seen as a physically attractive community asset.
- Salaries and tax contributions are lower than 2 and 3.
- While financially feasible, it is less physically attractive than 2.
- Given the goal of rapid exit by MMCIC and related community involvement, the community is more vulnerable to loss of control of the outcome of the conversion.

DoE

- Less economically attractive than other options.
- DoE's rapid exit goal is threatened.

MMCIC

- Risk to MMCIC will be reduced.
- A quick MMCIC exit will likely reduce the potential value of the transaction to MMCIC and, in turn, DoE.
- Transfer of the property to a private developer will reduce the ability for MMCIC to selectively market the property toward specific ends such as maximization of quality jobs.

Option 2

Community

- An environmentally safe cleanup is assumed.
- Increased investment in site and building improvements, increases the quality of the Mound as a private neighbor.
- Produces the highest number of high paying jobs, over the shortest period of time.
- Maximizes tax revenue.
- Success reduces risk and the potential of additional investment required of the community.

DoE

- Will have potentially less cleanup costs under this option, while enjoying the potential for a more rapid transition to a financially feasible development.

MMCIC

- This is the most financially feasible option.
- Jobs and economic benefits are maximized.
- The feasibility of keeping jobs and providing economic benefit to the community as a first priority is improved.
- There is a need for a successor public/private operator.

Option 3

Community

- An environmentally safe conversion is assumed.
- The most attractive to the community as an asset.
- The highest paying jobs.
- Significantly longer absorption period.
- Reduced potential for financial success.

DoE

- DoE cleanup costs potentially reduced under this option.
- The protracted absorption pace of this option increases the potential for MMCIC failure and the necessity for a continuing role for DoE.

MMCIC

- Not financially feasible because of a limited market.
- Results in a greatly extended time frame for implementation.
- Produces the most high paying jobs.
- Unable to create an "investment grade" property in which private developers will be interested in investing.

Summary

The overall summary of the evaluation of the three options is that Options 1 and 2 are financially feasible. Option 3 is not financially feasible and should not be pursued further as a strategy for successful conversion of the Mound. Between Options 1 and 2, it is Option 2 that should provide the basis for further development of a preferred option. This work should take advantage of the special characteristics of Options 1 and 3 that warrant further consideration.

The relative advantages and disadvantages of Options 1 and 2 are impacted by a series of variables including the pace of development, community goals, and operation and maintenance strategies and costs.

Options 1 and 2 feasibility is greatly impacted in a negative way if, for whatever reason, converted buildings are not available for marketing as anticipated in the financial model. Delays resulting from a protracted schedule for clean up and transfer will result in a requirement for additional grants to finance the ongoing operations of the MMCIC.

Options 1 and 2 feasibility is also impacted by the extent to which MMCIC management operations must be funded from real estate operations, i.e. from rental income as opposed to funds that are granted to MMCIC because of the additional demands for managing a conversion of the DoE facility to a financially viable private development. It is evident from the analysis that there is an amount of a management grant that will be required until such time as the transfer to a public/private or private real estate management organization is completed

Options 1 and 2 feasibility is impacted by the extent to which the DoE clean up and transfer process creates a facility that can be leased and operated for marketable lease rates. This will require at a minimum, bringing the buildings and site to a condition of code compliance, completing necessary deferred maintenance, and providing an energy system that produces steam and chilled water at market competitive rates. The extent to which additional improvements will be necessary will be the subject of further analysis of a preferred option for the reuse of the facility.

Option 2 offers greater potential for DoE savings than Option 1 because of the demolition, rather than preparation for reuse, of nearly 100,000 additional square feet of building.

Option 2 will be visually more attractive that Option 1 because of the additional investment in site and building improvements. As such, it will have more positive impact on abutting properties, and establish a positive direction for improvements that can be undertaken as land is sold and new development is accomplished.

Option 2 is more financially attractive to the community because is produces the highest salaries and, therefore, tax revenues.

Option 2 offers more community control of outcome than Option 1 because some form of public/private management is assumed as a vehicle for attraction and management of appropriate and necessary grants. These grants are intended to support the ongoing financial viability and ongoing success of Mound operations and development as a vehicle for creation of jobs.

Option 3 is not feasible to pursue further because of the combination of a limited market, resulting in a very long period of absorption, and a high level of investment, that will not result in a sufficiently high increase in lease income. These factors result in a scenario that is not financially satisfactory. It is recommended, however, that the aspirations for a high quality physical environment remain a goal for MMCIC or other successor developer/managers. Given this goal, it could be possible that over the long run, as the project demonstrates its success, land is developed, and rental levels increase with new leases, a series of upgrades may become affordable.