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Adams County Planning and
Development Department

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***Acknowledgement of a Memorandum of Understanding Between
Adams County and the Colorado Department of Natural Resources,
Division of Minerals and Geology***

Adams County and the Colorado Department of Natural Resources, Division of Minerals and Geology (DMG) entered into a cooperative agreement in October 2004 to coordinate information exchange and certain oversight activities to avoid inconsistent regulatory actions pertaining to the extraction of construction materials. Adams County is authorized to regulate use of land located within the unincorporated portions of the County. More particularly, the County has the ability to regulate location of activities and development which may result in significant changes to population density, provide for phased development of services and facilities, regulate the use of the land on the basis of impact to the community or the surrounding area, and otherwise provide planned and orderly use of the land and protection of the environment in a manner consistent with constitutional rights. The County does not regulate reclamation activities or the release of financial warranties posted by mining operators to ensure that reclamation activities take place. Rather, DMG and the Mined Land Reclamation Board have that authority and responsibility. However, counties clearly are empowered to regulate the use of mined properties, both during the life of the mine and after reclamation is complete.

Given the separate and independent regulatory authorities of DMG and the County, there is a potential for inconsistent decisions by the State and the County concerning construction materials mining operations. The parties intend to address that potential by ensuring communication occurs between the two governmental entities about their decisions, particularly post mining land use and bond release decisions. This Master Plan is intended to clearly state County policy and expectations to help guide operators in formulating a reclamation plan for the DMG. Adams County is encouraging the DMG to consider this document when permitting operations in Adams County. In no way does the County, through the adoption of this policy document, wish to usurp the authority of the DMG or imply the existence of additional regulatory authority at the County level.

Simply put, Adams County is expressing its desire to participate as a party in the State permitting process according to the terms of the MOU. The County will attempt to encourage the highest possible standard of mining reclamation in order to best protect its interests and those of its citizens. This document will not impact current mining permits, however the policies contained herein will be used to review confirmation of release requests from the Division of Minerals and Geology and will be applied to permit extensions, amendments, and renewals.

CHAPTER I

Introduction

This Master Plan is mandated by § 34-1-301, et seq., C.R.S. (see Appendix A). Populous counties (Counties with populations of 65,000 or more) were directed to make themselves aware of their local resources and to develop a plan outlining the following:

- 1) Map the location of resources;
- 2) Propose regulations permitting exploration and extraction to proceed in an orderly manner;
- 3) Protect known commercial mineral deposits from being covered by surface development so that extraction potential is maximized;
- 4) Encourage multiple-sequential use of property to be mined so that resource areas can contribute to the community before, during and after mining; and
- 5) Take into account the quality of life of the residents in and around areas that contain commercial mineral deposits.

State legislation specifically limited the scope of the Master Plan to limestone used for construction purposes, coal, sand, gravel, and quarry aggregate. Adams County's original Mineral Extraction Master Plan was adopted in 1983. Although there are only a small number of sand and gravel and quarry aggregate deposits left to be mined along the mineral rich South Platte River valley, this plan has been updated to ensure mining and reclamation efforts in Adams County meet current regulations and utilize the latest industry techniques and procedures.

Chapter II describes the known mineral resources of the County for the five minerals covered by the State statute. A body of background information has been assembled for each mineral to show where the resources are likely to be located and typical extraction techniques.

Chapter III sets forth the existing and proposed County procedures for regulating mineral extraction. These procedures include control of mining operations themselves and protection of commercial mineral deposits from overlying surface development that would preclude eventual extraction, subject to the exemptions provided by law.

Chapter IV covers certification and adoption of the Plan and provides for periodic revision and amendments to be made. Additional requirements and guidelines regarding minimizing negative impacts of mining and reclamation standards can also be found in this chapter.

CHAPTER II
ADAMS COUNTY RESOURCES

Limestone Use for Construction Purposes

There are no known deposits in Adams County of limestone that may be used for construction purposes.

Sand, Gravel, and Quarry Aggregate

Sand and gravel are "high-weight, low-value" resources and as such are extremely sensitive to handling and transportation costs. For example, assuming a 2004 value at the pit of six to ten dollars per ton for rock and five to six dollars per ton for sand, a 20-mile haul to a construction site could add three to five dollars per ton to the price. Sand and gravel are in constant demand in growing urban areas, but cannot be transported economically for a great distance. It is common, therefore, to find gravel pits close to urban markets. It is also common to find some conflict between mineral rights owners and development interests wanting to build on property above sand and gravel deposits.

Concerns about this conflict caused the Legislature to include a directive to the Colorado Geological Survey in §34-1-303, C.R.S. to study and map sand, gravel and quarry aggregate, and to "generally circulate" the resulting information. The Colorado Geological Survey research effort revealed considerable deposits of sand and gravel, but did not locate any commercial quarry aggregate in Adams County. The findings of this study are graphically depicted on Map 1.

Sand and gravel deposits were categorized by origin and by presumed value to the construction industry. The following is a brief explanation of Map 1.

Origin of Deposit	
*F - Floodplain deposit	A - Alluvial fan
*T - Terrace deposit	U - Upland deposit
*V - Valley fill	E - Wind-deposited sand
	M - Man-made deposit
* All three deposits are shown as V-Valley fill.	

Sand and gravel particles are created by the actions of water, heat, cold and wind on exposed rock. These particles wash downhill, ending up in streams and rivers where they are swept along until deposited in slow-moving sections of the watercourse. Streams rarely stay in the same location indefinitely. They meander within a floodplain, sometimes depositing material and sometimes cutting through earlier deposits. Along the way, the sand and gravel is sorted by size. Coarser gravel particles settle out first, while finer sand is carried further downstream. This sorting process created the very desirable sand and gravel deposits found along Clear Creek and the South Platte River.

Sand and gravel beds within the active portion of a streambed are called floodplain deposits. Terrace deposits occur above floodplain levels and generally are remnants along valley sides of previous floodplains. Together, floodplain and terrace deposits are called Valley Fill. Valley Fill is found within and adjacent to all of the major streambeds in Adams County.

Alluvial fans are found where fast mountain streams spread out onto a plain, where a river empties into a lake, or where small tributaries enter a wide floodplain. The sudden slowing of the water causes most of the particles it is carrying to drop out in a fan-shaped deposit. Alluvial fans are rare in the County.

Upland deposits of sand and gravel are elevated, often isolated, erosional remnants of older alluvial deposits, commonly of low quality because of their older geologic age and longer exposure to soil-forming processes. Such deposits are confined to western Adams County.

Wind-deposited sand is very common in eastern Colorado, including Adams County. Strong winds pick up sand from various areas and deposit it in dune formations. Highway departments commonly use these deposits for road construction and repair.

Man-made deposits may consist of slag heaps, inorganic landfills, or mine tailings. In Adams County, the largest man-made deposits are those created during gravel mining. Waste material includes overburden, soil that has been separated from gravel, and "squeegee," coarse sand with little commercial value.

Table 2.1	
Category	Type and Value of Material
1	Gravel, relatively clean and sound
2	Gravel, mixed with silt and clay (fines) decomposed rock and/or calcium carbonate (caliche)
3	Sand
4	Probable resource, unevaluated

(See Table 2.1 above.) Gravel that meets asphalt or concrete mix specifications has the highest commercial value (Category 1). This gravel is clean and fairly uniform, requiring little processing. It is particularly attractive to sand and gravel companies. Gravel with excess silt (Category 2) must be cleaned and graded to industry standards for high specification use. Extensive processing increases costs and may lower the amount of profit. Less processing may be required if the material is intended for lower specification use. Clean sand (Category 3) is a valuable resource, but it has a limited market outside of construction. Sand is used primarily to complete required gradations for concrete and asphalt mixes. In the eastern part of Adams County there are a number of unevaluated valley fill deposits (Category 4). It is suspected alluvial gravel exists but the quantity and quality are unknown.

History of Sand and Gravel Mining in Adams County

The history of sand and gravel production mirrors growth in the Denver Region.¹ In 1935, Denver County supplied nearly 90 percent of the area's requirements. This share dropped to 20 percent by 1950 and to zero by 1955. Some of the close-in resources were mined out while others were covered by urbanization and major projects such as Chatfield reservoir. In Adams County, Clear Creek has been almost completely mined, as have large parts of the South Platte Valley. In the future it is probable more gravel will be brought in from remote pits, such as Boulder Creek and St. Vrain Creek, and from rock quarries in the mountains. It is also possible urbanization to the east will make exploration of the V-4 (Valley fill, sand) deposits along Box Elder, Kiowa and Comanche Creeks financially attractive.

Adams County has led the Metro Area in recognizing the need for nearby aggregate sources and protecting them from premature development. In 1969, the County established a Mineral Conservation Zone District in which sand and gravel extraction was allowed. The Mineral Conservation Overlay Zone was established in 1979 in order to protect known deposits of this resource. The overlay shows areas "identified with resource category 1" on maps prepared by the Colorado Geological Survey.² Commercial deposits in the overlay should usually remain accessible or be mined before permanent improvements are placed on the land. At the same time, the Regulations were amended to allow aggregate extraction in any zone district by conditional use.

Information about Adams County geology and gravel resources shown on Maps 1 and 2 was updated in 2005 using data from the Colorado Geological Survey, the Division of Minerals and Geology, and the Adams County Planning Department.

Sources:

- 1 Urbanization and Its Impact on the Mineral Aggregate Industry in the Denver, Colorado Area, Bureau of Mines Information Circular 8320, by Matthew J. Sheridan, U.S. Department of the Interior, Bureau of Mines, 1967.
- 2 Special Publication 5A and 5B, Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties, Colorado Geological Survey, 1975.

[Click here to view the Sand and Gravel Resources Map](#)

Coal

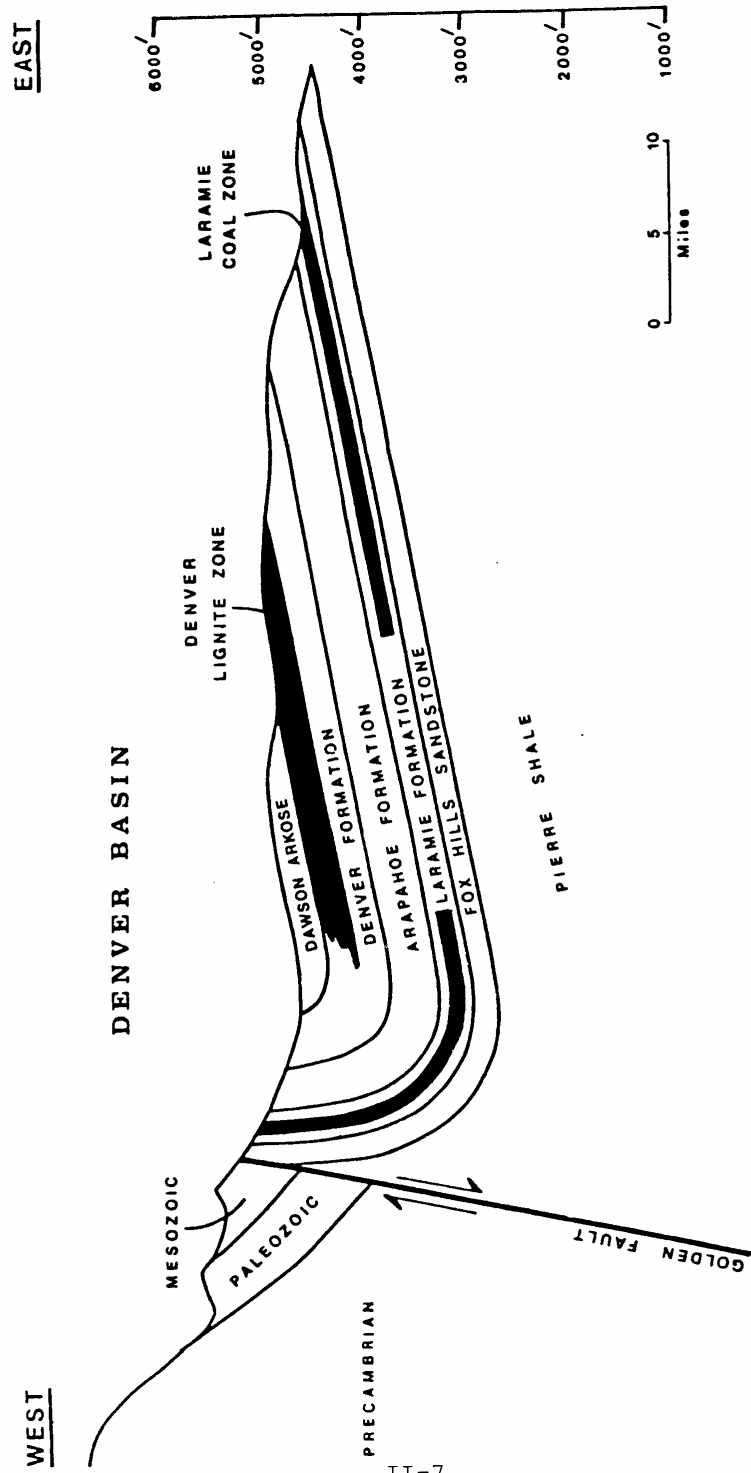
There are two significant coal-bearing formations underlying Adams County. Coal, ranging in quality from subbituminous B to lignite A, occurs in the lower 275 ft. of the Upper Cretaceous Laramie Formation. The thickness of this coal bed generally ranges from five to fifteen feet, but occasionally exceeds 20 feet. The early Paleocene lignite beds occur in the upper 500 feet of the Denver Formation and, near Watkins, are up to 60 feet thick.

The simplest way to understand the relationship between these two formations is to review the following Figure (Source; Kirkham and Ladwig, Colorado Geological Survey, 1979). Laramie coal is deeper, and generally of higher quality than Denver coal. Deposits are deep at the western end of the County and rise near the surface towards the east.

These coal resources are quite large. In the Denver East Quadrangle, which includes Arapahoe as well as Adams County, there are an estimated 16.6 billion tons of Laramie coal and 12.9 billion tons of Denver coal.

The heating value of these lignites is relatively low. Btu content for Laramie coal ranges from 5,900/lb. to 6,900/lb., while Denver coal ranges from 4,000/lb. to 7,400/lb. This compares with 8,300 to 10,500 Btu/lb. for subbituminous coal and 10,500 to 14,000 Btu/lb. for bituminous coal (Annual Book of ASTM Standards, Pt. 26, 1979)

Coal has been mined from the Laramie and Denver Formations since 1863, primarily using underground mines. The Denver Basin produced a total of 130 million tons of coal before the last active mine closed in 1979. Only 37,000 tons of coal came from Adams County.



II-7

Map 3

SOURCE: KIRKHAM AND LADWIG, COLORADO GEOLOGICAL SURVEY, 1979

Although underground mining is the traditional method of extracting coal, the trend in the western U.S. is towards strip mining. Open pit is used more frequently than strip mining and of the 12 operating coals mines in Colorado only 4 are open pit. Current strip mining practices dictate coal must be no deeper than 200-250 feet to be mined economically. The decision to mine a particular deposit, however, is based on a number of factors besides the overburden thickness, such as coal seam thickness, coal quality and areal extent.

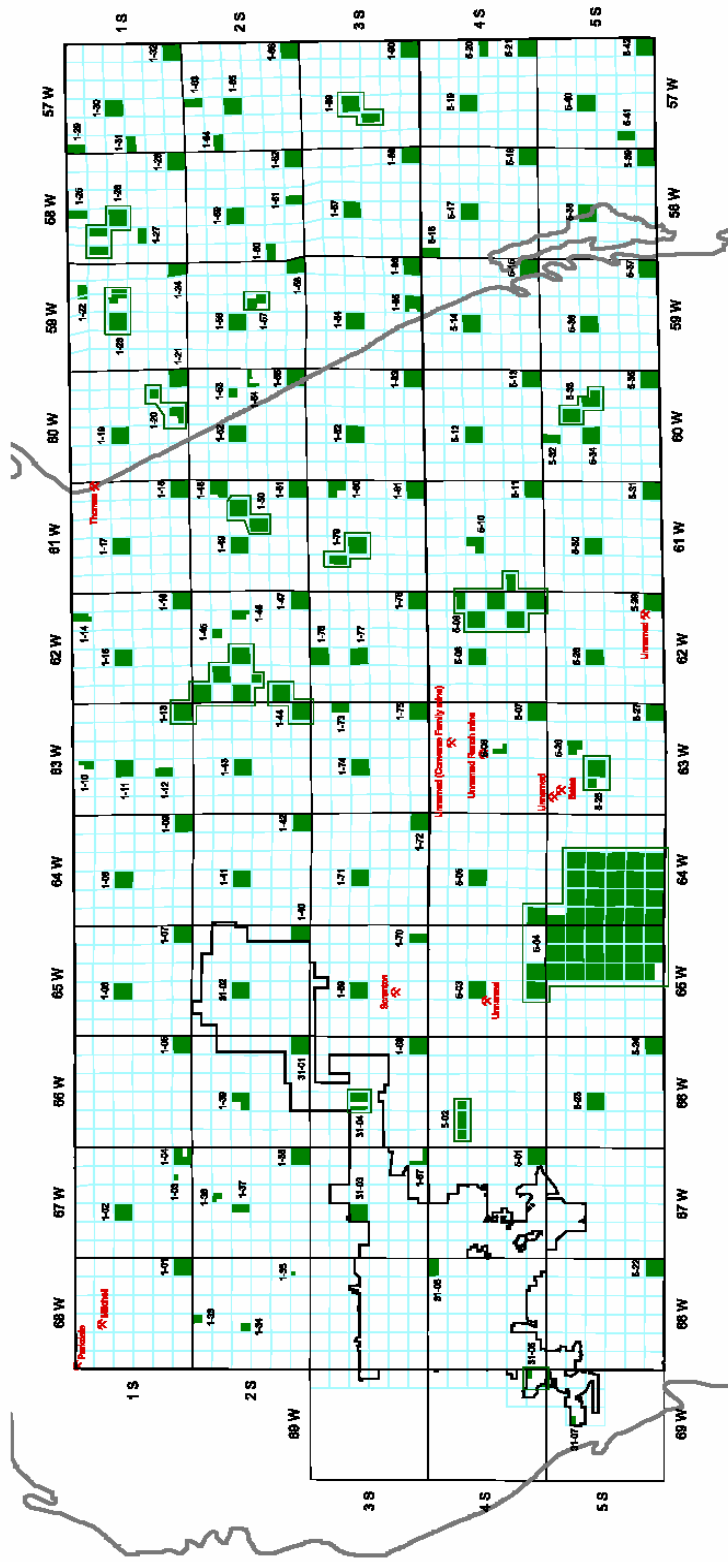
Another method tested is Underground Coal Gasification (UCG). In simplified terms, some of the coal is burned underground to produce heat. The heat, in turn, through a series of chemical reactions produces certain gases, some of which are combustible and which are drawn off through wells. This method of gas recovery presents complex technical problems and has not yet proven to be cost-effective in the U.S.

The Colorado Geological Survey has taken these technical and economic factors into account and mapped the potential, extractable coal resources of Adams County (see Maps 4 & 5)¹. There is a large strippable area in the eastern end of the County that would tap the Laramie Formation. In another area around Watkins, the Denver lignite is close enough to the surface to be mined. There are also several small locations in which UCG may be feasible. All of the major lignite-fueled facilities operating in the U.S. today are specifically designed to burn lignite and are located near the mines that serve them. No such facilities currently exist in the Denver area, which is the only feasible market for this Adams County resource. Lignite mining in the County, therefore, very probably is dependent upon development locally of a new power plant or industry designed to use lignite.

Protection of a resource within the guidelines of § 34-1-301, C.R.S. et seq., hinges upon commercial feasibility. Lignite has no local market and can only be transported economically for relatively short distances, if at all, primarily because of its low Btu value and related factors. The major reason lignite is not presently economical to mine in the Denver area is the presence nearby of much higher quality fuel. The Powder River Basin (southeastern Montana and northeastern Wyoming), in particular, produces "steam coal" with a higher BTU content than lignite from very large and efficient strip mines where the coal is generally thicker than in Adams County. The shipping distance to Denver is less than half what it is to Texas, making the "delivered" price quite competitive with what local lignite could be produced for. Colorado itself has bituminous coal mines in a number of places; transportation from these mines is even less costly than bringing coal in from the Powder River area. For these reasons there has been no lignite mining in the Denver area.

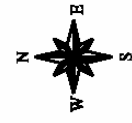
Source:

- 1 Energy Resources of the Denver and Basins, Colorado: Resource Characteristics, Development Potential and Environmental Problems, by Robert M. Kirkham and L.R. Ladwig, Colorado Geological Survey, Department of Natural Resources, State of Colorado, Denver, Colorado, 1980.



Adams, Arapahoe and Denver Counties
Denver Coal Basin and Historic Coal Mines

- Adams, Arapahoe and Denver Counties
- SLB Mineral Acreage
- Township and Range
- Sections
- Denver Coal Basin
- Historic coal mines



Map 5

CHAPTER III EXPLORATION AND EXTRACTION PROCEDURES

Chapter II has shown the quality of information about Adams County's resources vary considerably. In some areas, the location and value of minerals is well known, while in others, resources are only suspected to exist.

Adams County wishes to reduce some of the uncertainty created by this situation in which surface property owners are not aware of potential commercial minerals beneath their property, development interests are unclear about the value of their land for future urbanization, and mineral interests do not have enough data to know the worth of their holdings. The Plan, therefore, designates certain Mineral Evaluation Areas (MEAs) for both aggregate and coal. The County will refer all major land use cases in these areas to the Colorado Geological Survey and to mineral interest holders to encourage localized evaluations. If warranted by the accumulation of new information, new and reclassified deposits may be added to Colorado Geological Survey mapping and transferred from there to County resource maps. Over time, it is hoped knowledge of County resources will improve to the point it truly contributes to long-range planning. The County also encourages the Colorado Geological Survey to take the lead adopting a comprehensive evaluation scheme, such as the one proposed here, and collecting the information needed to make it work.

Sand and Gravel

The Mineral Conservation Overlay Zone District (MCO, Section 3.35 of the Adams County Development Manual) was established for two purposes. Its first function is to protect the County's best gravel deposits along Clear Creek and the South Platte River. These are Category 1 aggregate resources as defined by the Colorado Geological Survey (see Chapter II).

In MCO areas, the County presumes the gravel is economically extractable and requires it be mined prior to the placement of permanent structures on the surface. There are several defined exemptions to this requirement, but in most circumstances a landowner who wishes to develop his surface property must first demonstrate the gravel underneath cannot be economically mined. This presumption of economic viability does not hold with aggregate Categories 2, 3 and 4. (See table 2.1) In these categories a landowner may mine if he chooses, but is not required to do so by the County.

The second purpose of the MCO Zone is to establish a mining approval procedure in Adams County. The permit issued is for a Conditional Use that may be allowed in any zone district. A Conditional Use specifies operating performance standards outlining conditions to be met prior to a valid use. The permit may be revoked if conditions are not met. It is recommended a Conditional Use permit be required for strip mining coal.

A prospective mine operator must receive approval from Adams County and the Colorado Department of Natural Resources, Division of Minerals and Geology (DMG). The DMG details regulations for both gravel and coal mining.

Areas designated Mineral Conservation on County Zoning maps are presumed to be economical to mine. The resource (clean gravel) has a ready market in the Denver construction industry and is only a short distance away from where it will be used. The only reasons not to mine Category 1 aggregate would be if:

1. The deposits were very small or of awkward configuration,
2. The original mapping was in error regarding gravel quality,
3. The land was originally exempt from mineral conservation as provided by state statute,
4. There exist significant environmental concerns. For example, threatened or endangered species such as the Bald Eagle conservation easement at Howe-Haller pit.

Map 1 shows four resource categories in addition to the one protected by the Mineral Conservation Overlay. Category 2 is lower quality gravel, Category 3 is sand and Category 4 deposits are unevaluated. Of these Categories, 2 and 4 are suitable for a Mineral Evaluation procedure. Sand is a useful construction material, but because of its large geographic extent and low usage, intensive evaluation and protection efforts are not justified. Similarly, upland deposits (U2 and U4) are not justified because of extremely limited areal extent, low quality, and low historical usage.

Adams County considers extraction of deposits in Mineral Evaluation Areas 3 and 4 to be uneconomical. The possibility of finding valuable deposits, however, makes expert review worthwhile. The process will work as follows:

- 1) During a pre-application conference between Planning staff and a potential developer it is revealed the site in question overlies deposits identified as V-2 or V-4 on Map 1. These are located primarily along the South Platte River north of 144th Avenue or along major streams in eastern Adams County.
- 2) Planning staff requests the soils and geology report required of all developers include an evaluation of any underlying sand and gravel. The evaluation will be made by a geologist or soils scientist and a copy will be referred to the Colorado Geological Survey or consulting geologist for review. State regulations require that counties refer preliminary plans or plat to CGS for review, including reviews for commercial mineral deposits.
- 3) If it is determined Category 1 gravel deposits are not present, development may proceed without further investigation. If commercial deposits are discovered, mining access to the deposits must be maintained unless the property qualifies for exemption in accordance with Section 3-35-03 of the Zoning and Development Regulations. Exemptions are explained in detail in the last section of this Chapter.
- 4) Much of the sand and gravel resources in Adams County are in or proximate to the 100-year flood plain along streams and rivers. Gravel mine operations by nature impact the floodplain by changing the elevation of any given flood event and can create river or stream instability impacting adjacent property owners. Urban Drainage and Flood Control District developed and published in 1987 Technical

Review Guidelines for Gravel Mining Activities as contained in Appendix B. Mining operations within or adjacent to the 100-year floodplain along the South Platte River or Clear Creek in Adams County must comply with the guideline criteria. Additionally, all such mine proposals will be referred to the Urban Drainage and Flood Control District for determination of compliance.

Coal

The Mineral Conservation Overlay Zone District would be an appropriate means by which the County could protect the known commercial mineral deposits of coal from being covered by surface development, establish a mining approval procedure, and encourage multiple-sequential use of property to be mined. To accomplish this end, the conditional use standards would need to be modified to reflect the differences between gravel and coal mining. It is recommended the County permit for conditional use rely heavily upon the Surface Mining and Control Reclamation Act of 1977 (SMCRA), the Colorado Coal Act, and Regulations of the Colorado Mined Land Reclamation Board for Coal Mining, 1982, in developing standards for permitting coal mining operations. It is further recommended the County seek technical guidance from the Mined Land Reclamation Board and the Office of Surface Mining, with input from the Colorado Mining Association, if these regulations are developed.

Lignite and sub-bituminous coal have never been mined on a large scale in Adams County. Maps 4 and 5, which illustrate these potential resources, is based upon a variety of drill hole data, not upon the systematic evaluation accompanying a mining effort. The decision to mine lignite or coal in the County will be determined by overburden thickness, deposit thickness, deposit quality, deposit continuity, the ability to obtain rights to a logical mining unit (LMU) and other factors. The most desirable situation is one in which the overburden is less than 200 feet thick and there is a substantial continuous lignite or coal bed to mine. Somewhat less desirable, but possibly still feasible, are several thinner beds that overlie one another.

The Colorado Geological Survey pulled together information regarding these factors to identify where mining might take place. Denver Formation lignite is under the western third of Adams County and Laramie Formation lignite or sub-bituminous coal is under most of the County. There are only two areas, however, in which the lignite and coal are close enough to the surface to be strip-mined. One, in the Denver Formation, covers 53 square miles in the south central part of the County. The second is in the Laramie Formation and covers 101 square miles in a band running north/south through the County about fifteen miles east of Strasburg. Both areas also extend through Arapahoe County and were part of the Colorado Geological Survey study. This first stage evaluation established lignite and coal exist and are close enough to the surface to be strip-mined. Land in these two general areas will be designated "L-4" by Adams County. The Colorado Geological Survey study also identified areas possibly suitable for Underground Coal Gasification. This process may cause subsidence at the

surface. The potential for subsidence will be taken into account in establishing the mining area designation proposed in the Plan.

The second feature of the Colorado Geological Survey study established stratigraphy for both lignite formations. The beds with greatest economic potential, because of area covered and probable thickness, were mapped. This effort helped to identify locations in which one bed would contain enough lignite to justify mining. The presence of other, thinner, deposits primarily above and in some cases below the main seam can add to a mine's economic viability. There must, however, be a substantial single bed or combination of beds to sustain an assumed production rate for a number of years. Several promising areas were discovered and are listed below.

Denver Formation	Laramie Formation
A bed	*B bed
B bed	*A, Upper bed
*C, Lowry bed	*A, Lower bed
*D, Bennett bed	*E, Upper Watkins bed
*Lower Watkins bed	
* - Mapped individually by Colorado Geological Survey.	

The Lowry bed (Denver Formation) does not extend far into Adams County. The thickest portion of the seam lies about seven miles southeast of Watkins in Arapahoe County.

The Bennett bed has three favorable areas. The first, about fifteen square miles in extent, is located northwest of Watkins. Another smaller deposit is found five miles southeast of Watkins in Arapahoe County. The largest deposit is located just east of Box Elder Creek, about five miles south of I-70, extending into Arapahoe County.

The Upper Watkins bed has its thickest deposit just east of Watkins. This reserve covers about thirteen square miles in Adams County and six to seven square miles in Arapahoe County. There is also a more extensive but thinner deposit ten miles southeast of Watkins.

The Lower Watkins bed splits off from the Upper Watkins south of I-70 and is not found in Adams County. The thickest deposit is about fifteen miles south of Watkins in Arapahoe County.

The Colorado Geological Survey did not as clearly map the B Bed of the Laramie Formation as other beds. The thickest area appears to be along Bijou Creek in Adams County, but the north/south extent of the seam was not shown.

The Upper A Bed of the Laramie Formation has a thick deposit covering about eighteen square miles northeast of Strasburg. Portions of this bed underlie the B Bed just mentioned, creating the potential to tap two fairly thick seams through one strip mine.

This second stage evaluation shows where individual lignite deposits may be thick enough and extensive enough to justify mining. They are designated "L-3" by this Plan and will become Mineral Evaluation Areas. The process will work as follows:

- 1) During a pre-application conference between Planning staff and a potential developer it will be revealed if the site in question overlies lignite deposits.
- 2) Planning staff refers a copy of the proposal to the Colorado Geological Survey or consulting geologist and to the major mineral interest holders. If requested to do so by the C.G.S. or the consulting geologist, Adams County will delay action on the land use change until a mineral evaluation can be completed. Such evaluations will be undertaken by a geologist and will be funded by the mineral interest holders.
- 3) The study shall recommend the area in question either be changed from an L-3 designation to L-2 or eliminated from the Mineral Evaluation Area.

An L-2 designation may be made after a coal deposit has been tested and mapped in sufficient detail to develop a mining plan which sets forth the boundaries of a logical mining unit (LMU) and after an extractor submits satisfactory evidence of title or right to conduct mining operations within the boundaries of the proposed logical mining unit. The logical mining unit as proposed within the mining plan would have to be of sufficient size to demonstrate adequate coal quality and quantity in the defined deposit such that mining would be justified provided a market exists for the product. If one extractor or a similar single entity such as a consortium or joint venture does not hold ownership or the right to mine, acquisition of such rights will be necessary to obtain L-2 designation.

L-2 areas may be converted to L-1 areas and receive Mineral Conservation Overlay designation in the County Zoning Regulations. Adams County will encourage arrangements to be made that will convert L-2 areas to L-1. In order to do this, the mineral interest holder may submit information demonstrating a market for the coal or have a present intent to mine coal. A "demonstrated market" consists of:

- 1) An existing facility that burns lignite in large enough quantities to justify opening a mine.
- 2) A planned facility that will burn lignite. In this case "planned" means scheduled construction of a new plant designed for lignite or conversion of an existing plant to lignite fuel.
- 3) A joint venture, contract obligation or other definite arrangement between a mining company and a potential customer enforceable against the mining company to plan a lignite-burning facility. Such arrangement must be designed to create a market for a specific lignite deposit within ten years.

The “present intent to mine coal” shall be evidenced by binding contractual agreements to mine at some future date certain. A commercial coal deposit is thus defined as a deposit of coal:

- 1) Of sufficient quality and quantity in an accessible location such that it may be technically feasible to extract;
- 2) For which deposit there has been testing and mapping in sufficient detail to develop a mining plan and to define a logical mining unit;
- 3) And for which there exists, by ownership or contractual right, the ability on the part of an extractor to mine; and
- 4) For which product there exists a market or, in the alternative, a present intent to mine.

This classification system establishes what we believe to be a reasonable definition of what constitutes a commercial coal deposit after considering all of the factors dictated by state statute. Specifically, § 34-1-302 (1), C.R.S. directs "commercial mineral deposit" is to include "coal...for which extraction is or would be commercially feasible and regarding which it can be demonstrated by geologic, mineralogic, or other scientific data that such deposit has significant economic or strategic value to the area, state, or nation."(Emphasis added) Further, § 34-1-305 (2), C.R.S. sets forth "after adoption of a master plan for extraction...no board of county commissioners...(may) by...action or inaction permit the use of any area containing a commercial mineral deposit in a manner that would interfere with the present or future extraction of such deposit by an extractor." Finally, the County is directed to balance “the potential for effective multiple-sequential use which would result in the optimum benefit to the land owner, neighboring residents, and the community as a whole, as well as the preservation of land to enhance development to the physically attractive surroundings compatible with the surrounding area and the quality of life of the residents in and around areas which contain commercial mineral deposits” with the protection of commercial mineral deposits. See § 34-1-304, C.R.S.

The County is directed by State law to consider in the adoption of this plan the potential for effective multiple sequential use of the property and balance this with the maximization of commercial mineral deposits. Since the effect of designating an area a commercial mineral deposit may deprive the landowner of certain uses of property, such as the construction of permanent structures that would preclude the extraction of a commercial mineral deposit, it is only reasonable that we place the burden upon the extractor to show the extraction of the mineral deposit will be commercially feasible. But the demonstration of such feasibility is not to be made in a vacuum. Alternative sources of energy and alternative surface uses for the land must be considered. It is the position of Adams County, therefore, that unless it can be shown the mineral will be extracted at a definite time in the future, the extractor cannot maintain the argument a structure will permanently interfere with the extraction of the mineral. Multiple-sequential use of property does not dictate the property should first be used for mining purposes and thereafter reclaimed and used for other purposes. Multiple-sequential use as allowed under this plan would permit the surface property owner to use his property by the construction of structures or otherwise

until such time as the mineral deposit became commercially feasible to mine. Thereafter, mining could occur and subsequently the property could be reclaimed for other uses.

Once the showing is made to the satisfaction of the County of the presence of commercial mineral deposits, the extractor is entitled to the public protection afforded by § 34-1-301 C.R.S. et seq. The County, as a policy matter, also encourages operators to demonstrate a present intent to mine these deposits in order to obtain a conditional use permit. It must be emphasized although the mineral extractor has a burden hereunder to show extraction would be commercially feasible at some definite time in the future, these regulations do not limit the extractor as to the amount of time.

It must further be emphasized should an extractor not be able to make a sufficient showing to be entitled to public protection under the act, he may exercise his own initiative to seek private protection by contractual agreement with the surface property owner. This private protection would occur when the surface property owner and the mineral interest holder (if separate) jointly agreed to maintain mining access to the deposit for a limited period of time, or in perpetuity. This agreement may be made through:

- 1) Fee simple purchase of one interest by the other. If surface and mineral ownership is unified, private use conflicts should be eliminated.
- 2) Purchase or lease of the development rights of the surface property. The right to eventually develop land is considered inherent provided the necessary utilities, services and roads are available and there are no overriding environmental constraints. This right can be purchased by a private party or a unit of government for the purpose of keeping the land open. Adams County has developed a transfer of development rights program and actively pursues conservation easements on properties with valuable natural resources through
- 3) Investment agreement between surface owner and mineral interest holder.

The options listed above are designed to provide direction to property owners and are not considered inclusive.

Exemptions

State Statute § 34-1-305 provides for certain exemptions to the requirement mineral deposits can be extracted prior to development of the surface property. They are:

§34-1-305 C.R.S.

- 1) Nothing in this section shall be construed to prohibit a board of county commissioners from zoning or rezoning land to permit a certain use, if said use does not permit erection of permanent structures upon, or otherwise permanently preclude the extraction of commercial mineral deposits by an extractor from, land subject to said use.

- 2) Nothing in this section shall be construed to prohibit a board of county commissioners from zoning for agricultural use, only, land not otherwise zoned on July 1, 1973.
- 3) Nothing in this section shall be construed to prohibit a use of zoned land permissible under the zoning governing such land on July 1, 1973.
- 4) Nothing in this section shall be construed to prohibit a board of county commissioners from acquiring property known to contain a commercial mineral deposit and using said property for a public purpose; except that such use shall not permit erection of permanent structures that would preclude permanently the extraction of commercial mineral deposits.

Adams County is fully zoned today and was zoned prior to July 1, 1973. In 1973 the County was operating under Zoning Regulations, Adams County, Colorado, 969, as amended. Maps delineating the zoning classification at said time of various parcels of land are maintained in the Adams County Planning Department. Surface property that overlies a commercial mineral deposit may be developed for uses permitted in the regulations of 1973. Authority to interpret the former regulations and maps rests with the Director of Planning and Development.

Surface property overlying commercial minerals may also be "zoned for agricultural use." Adams County has interpreted this exemption to mean the uses allowed in farming areas by the current Zoning Regulations (1980, as amended). The agricultural Zone District used for almost all rural areas is "A-3." Approximately 98% of the unincorporated portion of the County is zoned A-3, so it is probable the majority of all mineral deposits are affected by uses allowed in A-3 areas. The following are principle permitted uses in the A-3 Zone District:

1. Farming
2. Nurseries
3. Ranching
4. Single Family Dwelling
5. Group Living Facility (1 to 5 persons)
6. Outdoor Public Uses
7. Bed and Breakfast
8. Agricultural, accessory
9. Residential, accessory

The uses by right listed above require no County involvement except when a building permit is required. In addition to these is a class of uses considered to be in keeping with agricultural areas, but require County review to ensure community protection. These are Conditional Use Permits and may be allowed if certain requirements are met. Requirements for screening, landscaping, good vehicle access, or limited hours of operation are designed to make the use attractive and keep it compatible with its surroundings.

1. Agricultural Support Businesses and Services
2. Agricultural Business
3. Two-Family Dwelling

4. Group Living Facility (in excess of 5 persons)
5. Group Living Facility (with more than 1 registered sex offender)
6. Institutional Care
7. Jails and Prisons
8. Neighborhood Indoor Uses
9. Public Service
10. Universities
11. Airports, Landing Strips, and Heliports
12. Animal Hospitals
13. Campgrounds, Commercial
14. Communications Towers, Commercial
15. Golf Course and Driving Range, Commercial
16. Heavy Retail and Heavy Services
17. Kennel, Commercial
18. Outdoor Commercial Recreation
19. Parking Lot, Commercial
20. Racing Facilities
21. Services
22. Trade Schools
23. Extraction and Disposal Uses (Inert fills may be processed as a Special Use Permit, Conditional Use Permit or Certificate of Designation pursuant to Chapter 2)
24. Heavy Industry (Excluding Solid Waste Transfer Stations and Scrap Tire Recycling Facilities)
25. Light Industry
26. Major Energy Facilities

Other uses not specifically named may be permitted if found to be appropriate in agricultural areas. The Adams County Development Standards and Regulations protect commercial aggregate deposits through the use of the overlay zone discussed earlier. There are certain exemptions to the mining requirements listed in Chapter 3.

3-35-03-01 AREAS EXEMPTED BY THE DIRECTOR

The Director of Planning and Development shall exempt lands meeting the following criteria from the restrictions of the MCO District.

1. Any parcel of land intended for uses that were allowed in the underlying zone district prior to July 1, 1973.
2. Any parcels of land five (5) acres or less in size that were in existence as a separate parcel prior to July 1, 1973.
3. Any parcel of land in excess of five (5) acres where it can be demonstrated the mineral resource is not of commercial quality and quantity.

The Director of Planning and Development may require competent proof a lot meets these criteria, including a written opinion from the State Geological Survey, where deemed appropriate.

3-35-03-02 AREAS EXEMPTED BY THE BOARD OF ADJUSTMENT

The Board of Adjustment may exempt any lot from the restrictions of the Mineral Conservation Overlay District where a property owner can demonstrate that the restriction would make it impossible to develop the land for any reasonable economic and compatible use in the area including gravel extraction.

These exemptions were created principally because the State Legislature did not define "commercial" deposits of minerals, either in size or in quality. The exemptions in the Development Standards and Regulations currently apply to Mineral Conservation Overlay deposits (Category 1). This Plan recommends exemptions apply to L-1 lignite deposits as well. Although the Plan does not designate any L-1 areas, it creates procedures for delineating these areas in cooperation with the Colorado Geological Survey. It is therefore anticipated L-1 land may be designated and exemption guidelines will be needed.

CHAPTER IV **PLAN ADOPTION**

The Plan shall be adopted pursuant to and in accordance with § 34-1-304, C.R.S.

Certification of Plan

It is the responsibility of the Adams County Planning Commission to approve the text and maps of this Mineral Extraction Master Plan. After having done so the Commission certifies the Plan to the Board of County Commissioners, assuring the document meets federal and state guidelines, as well as local needs. The following sections explain existing federal and state requirements and demonstrate how this Plan satisfies the intent of the law.

Coordination with the State of Colorado

Development of this Plan was coordinated with the Colorado Department of Natural Resources, Division of Minerals and Geology, and the Colorado Geological Survey. The County has already adopted the C.G.S. grading system for aggregate, adopting it as part of the Development Standards and Regulations.

To date, C.G.S. has not developed a grading system for lignite. A system is recommended as part of this Plan (L-4 through L-1); if it is approved or modified and approved by C.G.S., the agency and Adams County will be in accord on this resource as well.

Multiple-Sequential Use of Commercial Mineral Property

It is the intent of the state legislature, through this statutory guideline, to make mining areas beneficial to the community before, during and after mining. The Plan, which indicates the location of all sand and gravel and coal deposits, will enable surface property owners to be aware of the presence of potentially commercial mineral deposits beneath their lands. At the same time the Development Standards and Regulations clearly state a number of uses may be conducted on the property before mining takes place. This allows for productive use of the property while waiting for mining to start.

Mining operations are controlled primarily by the mining plan required by the State Mined Land Reclamation Board. A Conditional Use Permit, approved by the Board of County Commissioners, may further regulate the use of the land on the basis of impact to the community or the surrounding area. The County does not regulate reclamation per se, but can provide for the planned and orderly use of the land and protection of the environment in regards to post-mining land

uses. Together, these regulations ensure mining and reclamation is compatible with the surrounding community.

The State Mined Land Reclamation Board also requires a reclamation plan. Adams County would prefer reclamation plans from gravel operators include designs for a particular "after use" such as recreation, open space, housing or offices. The Plan should stipulate how the property will eventually be used for some beneficial purpose.

Site Development Policies

In-Progress Reclamation

*NOTE: The following in-process reclamation policies are not meant to impose a reclamation standard. Adams County recognizes that the Mined Land Reclamation Board and the Division of Minerals and Geology have exclusive jurisdiction over reclamation, as that term is defined in § 34-32-103(13), C.R.S., and § 34-32.5-103(19) C.R.S., and over reclamation plans under the Colorado Surface Coal Mining Reclamation Act, as defined at § 34-33-103(23). To the extent that these policies conflict with State requirements for reclamation, the State regulations control.

Policy 1

Regulation of reclamation is within the purview of the State Division of Minerals and Geology (DMG). Adams County will cooperate with the DMG regarding reclamation objectives.

Policy 2

Areas of disturbance due to mining activities should be kept to a minimum.

Policy 3

Mine operators should start to stabilize and reclaim the affected land using natural and replanted vegetation and natural and artificial topography as soon as practicable after mining begins. This in-progress reclamation should be scheduled to coincide with the site development schedule.

Policy 4

To the extent appropriate, in-progress reclamation effort should utilize existing topsoil and/or other topsoil materials consistent with the replanting program.

Policy 5

The in-progress reclamation effort should endeavor to utilize native species of vegetation consistent with any replanting program and any after use plans.

Policy 6

Mining operations that temporarily cease activity for a period of six months or more should carry out an interim reclamation program compatible with future continuation of the operation. Operators obligated under a Storm Water

Management Plan (SWMP) should implement erosion control measures within thirty days if eroded soil can leave the site and enter “waters of the State.”

Policy 7

In keeping with NPDES regulations, mine operators should practice erosion control and slope stabilization. Wherever possible, grades within the mining boundaries should direct storm water drainage flow into the pit.

Policy 8

In-progress reclamation should be compatible with the final reclamation plans and any proposed after uses for the site.

Final Reclamation

*NOTE: The following final reclamation policies are not meant to impose a reclamation standard. Adams County recognizes that the Mined Land Reclamation Board and the Division of Minerals and Geology have exclusive jurisdiction over reclamation, as that term is defined in § 34-32-103(13), C.R.S., and § 34-32.5-103(19) C.R.S., and over reclamation plans under the Colorado Surface Coal Mining Reclamation Act, as defined at § 34-33-103(23). To the extent that these policies conflict with State requirements for reclamation, the State regulations control.

Policy 1

Final reclamation should commence no more than three months after mining ceases. Once final reclamation is satisfactorily completed, the bond for the site may be released by the State.

Policy 2

The final reclamation of the mine site should return the land to a form and productivity in conformance with the established land use plan for the area. This plan should move toward a balanced ecological state that does not substantially contribute to environmental deterioration. To this end, the use of native, non-irrigated and non-invasive plant species is encouraged.

Policy 3

The final reclamation effort should endeavor to utilize existing topsoil and/or other topsoil materials consistent with any replanting program.

Policy 4

The final reclamation effort should endeavor to utilize indigenous and/or other types of vegetation consistent with any replanting program and any after-use plans.

After Use

Policy 1

Any proposed after use of the mine site should be in conformance with established Adams County future land use policy plans and should be beneficial and complementary to the surrounding neighborhood.

Policy 2

Reclaimed mine sites must be safe. Sites that are hazardous and/or environmentally degraded should have means to warn and protect people from hazardous conditions until the hazard can be mitigated.

Policy 3

The operator should maintain the mine site until it has been stabilized and any replanted vegetation takes hold.

Quality of Life of Residents In and Around Extraction Areas

The Development Standards and Regulations discussed earlier in the Plan are written to protect existing residents as much as possible without making mineral extraction uneconomical. Coal mining has not been undertaken in the County since it became zoned; if a strip mine is opened federal regulations will control its operation. However, a Conditional Use Permit will also need to be issued by the County. At said time, the County will seek expert advice from various sources on how to structure the permit to best protect existing residents and the environment.

Exposure to negative impacts can seriously affect the quality of life of residents near mining operations. Unfortunately, some impacts are unavoidable, although many can be minimized. The following sections outline potential negative impacts and provide guidance on techniques the County encourages the DMG to utilize in their permits to minimize those impacts.

A. VISUAL IMPACTS

1. Goal

Protect visual resources that currently exist in Adams County and mitigate visual impacts resulting from aggregate mining operations.

2. Overview of the Topic

The sights that surround people are an important aspect of the quality of life in a community. Maintaining and/or enhancing quality of life by ensuring land use does not adversely affect the well being of County inhabitants is important to maintaining a sense of community.

The backdrop of the Front Range is a major landmark for the entire Denver Metropolitan Area. The different parts of Adams County contain unique characteristics and landscapes that are valuable in attracting new residents and employers. Careful attention to enhancing and maintaining these natural attributes, as development occurs, can ensure a highly desirable quality of life in the County. This can be achieved by:

- a. Maintaining the visual quality of areas valued for their views.
- b. Using the natural landscape, vegetation, and topography to hide development.
- c. Maintaining landscapes with a unique visual quality.

3. Recommendations

All mining plans should strive to minimize visibility into mining sites. Unique landscapes, where the visual attraction is unusual, such as: ridges and valleys with associated wildlife habitat, riparian habitat, and scenic overlooks and vistas, should be preserved to the greatest extent possible. These unique areas provide a sense of identity and pride for a community or region.

- a. To the greatest extent possible, mines and equipment should be situated where they are not highly visible to the public.
- b. Minimal amounts of vegetation should be disturbed during a mining operation to help mitigate visual impacts.
- c. Phased mining and reclamation measures should be considered to mitigate visual impacts. This procedure limits the number of mined acres disturbed at any given time.
- d. Utilize berms, stockpiling of topsoil, trees, and other screening techniques, taking care that such measures do not impact floodplains.
- e. Results of visibility mitigation should be aesthetically pleasing and in keeping with the surrounding environment.
- f. Excavation in visually sensitive areas such as ridges, hilltops, cottonwood stands, raptor nesting or feeding areas, riparian habitat, and scenic areas should be minimized.
- g. Buildings and facilities should be constructed and painted to minimize their visual impact. Locating structures, machinery and equipment storage and repair areas, utility lines, access roads and driveways, fences, gates, signs, and mined-material stockpiles in visually sensitive areas such as ridges, hilltops, and scenic areas should be avoided.
- h. The location and design of structures, machinery and equipment storage and repair areas, utility lines, access roads and driveways, fences, gates, signs, and mined-material stockpiles should be sensitive to the natural color, form, and texture of the surrounding area.
- i. The excavated portion of mine sites, structures, machinery and equipment storage and repair areas, utility lines, mined material stockpiles, access roads and driveways should be screened from view or camouflaged by methods to include, but not to be limited to, the following:
 - (1) Existing and/or replanted vegetation;

- (2) Existing landforms and/or artificially created landforms.
- j. Any lighting glare from the mine site should not intrude on the privacy of neighboring residences.

B. AIR QUALITY

1. Goal

Minimize impacts on air quality due to aggregate mining operations.

2. Overview of the Topic

Air quality is a concern to all the residents of Adams County. The air quality program in the State of Colorado is administered by the Colorado Department of Health, which is responsible for implementing and enforcing the requirements of the National Clean Air Act through enabling legislation passed into law by the State of Colorado. The State Health Department is the lead agency responsible for permitting and enforcement at the state and local level. The County does not have the time, finances, or staff to duplicate the State Health Department's regulations, monitoring procedures, or enforcement role.

3. Mitigation Techniques

Mitigation techniques for dust emissions from mining and processing range from spraying water on the dust source to using state-of-the-art dust collectors. The methods used are usually determined by the sources to be controlled. For example, dust from unpaved roads, which causes about 95% of all dust problems, can be controlled by watering, oiling, paving or using crusting agents mixed with water and sprayed on the road surface and allowed to dry to form a hard surface. Colorado Hazardous Waste Regulation prohibits the use of waste oil and used oil for dust suppression. [CHWR Sections 267.23(b)(7)] Intersections where trucks enter a paved highway on a mining route should be swept on a regular basis. On the processing side, a number of control technologies are available, including: wet suppression, fabric collectors, mechanical collectors, and scrubbers. Operators should always use track out pads. These methods used alone or in combination, have proven to be effective in controlling dust emissions from mining operations.

C. NOISE

1. Goal

Maintain acceptable levels of noise in urban, residential, rural, and commercial areas.

2. Overview of the Topic

Citizens are concerned about noise impacts of potential and/or actual mining operations. The Noise Abatement Act of the State of Colorado, Article 12, Title 25, specifies permissible noise levels for specific land uses, including urban areas. Mitigation measures listed below should be used to reduce noise pollution. The permitting process should examine the individual characteristics of the specific site to determine which techniques are most appropriate.

3. Mitigation Techniques

There are a variety of ways to regulate and mitigate impacts of noise. Possibilities include:

- a. Regulate hours of mining operation;
- b. Utilize equipment with low noise emissions;
- c. Locate stockpiles to form sound buffers;
- d. Construct berms to act as sound buffers;
- e. Utilize alternate means of transportation, i.e. field conveyors;
- f. Rubberize surfaces in the plant;
- g. Enclose equipment;
- h. Utilize alternatives to back-up alarms on equipment, where approved by MSHA;
- i. Limit the proximity of mining operations to residential development or commercial areas;
- j. Move operation out of line of sight;
- k. Limit operation when wind speed and direction is unfavorable for operation and produces excess noise.

D. WATER QUALITY AND QUANTITY

1. Goal

To assure aggregate mining activities minimize negative effects to water quality or quantity.

2. Overview of the Topic

A decline in water quality or quantity is considered by citizens to be a very serious impact of aggregate mining activities. Many companies have a history of mitigating potential or actual impacts on water wells of residences near mining operations. Mitigation measures have included connecting affected properties to local water systems, trucking in water, drilling new wells, or refurbishing old ones.

Mining operations may impact surface waters in several ways:

- 1) Introduction of contaminants (primarily sediment),
- 2) Alteration of the volume of baseline flow, and
- 3) Storm runoff impacts.

Generally, construction aggregate mines have limited impact on surface waters compared to other types of mining operations. The potential impacts listed above are routinely controlled and are regulated by County policy (i.e. County drainage requirements), Colorado Department of Health regulations (i.e. National Pollutant Discharge Elimination System permit NPDES), and the U.S. Army Corps of Engineers (i.e. "404" permit for dredge and fill in stream channels or wetlands). The Colorado Division of Minerals and Geology also regulates hydrologic impacts to surface waters.

Dry land gravel mining and rock quarrying tend to have lesser impacts than mining in an alluvial valley or in a stream channel. Mining in or adjacent to a perennial stream greatly increases regulatory complexity. In any case, surface waters should be protected and off-site drainage impacts should be mitigated.

3. Mitigation Techniques

The following procedures for assessing and monitoring a proposed project's impact on water:

- a. Potential or actual impacts on water quantity and quality due to proposed mining operations should be discussed at the pre-hearing meetings between the applicant, potentially affected citizens and permitting agencies. Procedures and mitigation measures should be negotiated prior to beginning mining operations.
- b. The County and/or State Engineer should advise operators of their rights and responsibilities regarding water on their properties. All wells that may be potentially affected by mining operations should be registered with the State Water Engineer, Colorado Division of Water Resources.
- c. Potentially impacted wells should be measured and logged for quantity and quality of water by the applicant with permission from the property

- owner prior to the inception of mining operations. These measurements should take into consideration: seasonal production, wet/dry years, use of water by household appliances, annual history of production, age of the well, depth of the well, the casing and overall condition of the well, and any other relevant factors that might affect the well's performance. This information can then be used as baseline data from which impacts of mining can be measured. Mining activities should not have a negative impact on wells.
- d. If there is to be a water augmentation plan, citizens need to know when an application is made, when State approval has been granted, and the terms of the plan.
 - e. If water is brought on-site and stored, it should be in adequate quantity to meet worst-case safety requirements as well as day-to-day operations.
 - f. If an applicant claims its operation will not impact the water resources of citizens adjacent to the operation, then the applicant should be willing to make some guarantees. Guarantees by an applicant may include, but are not limited to: contingency plans, anticipatory mitigation measures, bonding or other tangible means of demonstrating good faith performance.
 - g. Agreements need to be made between citizens, an applicant and governmental regulatory agencies regarding who will determine if a water supply has been impacted by a mining operation, what standards and criteria will be used to make this determination, and what the time frame for the evaluation will be. These agreements need to be in place prior to the company's initiating mining operations.
 - h. The applicant, prior to the initiation of mining activities, should obtain all required local, State and Federal permits. Permits may not necessarily be issued prior to zoning approval, but evidence of permit issuance should be supplied to the County before construction and mining begins.
 - i. All fuel, chemicals, oil, and grease should be stored and maintained in such a way as to prevent accidental discharge to surface waters.
 - j. Sediment should be controlled using revegetation, runoff diversion ditches, sediment ponds, and other erosion and sedimentation control techniques, as appropriate.
 - k. Stream flows should not significantly increase or decrease as a result of mining activities.
 - l. Provisions for controlling storm runoff and site drainage should be included in the mining application. Off-site runoff and drainage impacts should be minimized or mitigated.

E. WILDLIFE AND VEGETATION

1. Goal

Minimize the impacts of aggregate mining operations on wildlife.

2. Overview of the Topic

Endangered species are protected under the Federal Endangered Species Act. Research and extensive documentation is necessary before a species can be declared endangered or threatened.

In the County, wildlife protection is primarily detailed in the County land use plan, local community plans, and indirectly through Mined Land Reclamation Board (MLRB) regulations. When an applicant proposes a mining operation, the MLRB asks for comments on the proposal from the Colorado Division of Wildlife. The Division of Wildlife, while it cannot prevent a permit, does have the authority to comment and thereby affect a permitting decision by MLRB.

3. Mitigation Techniques

The following measures shall be used to mitigate impacts on wildlife:

- a. Wildlife and vegetation surveys
 1. Pre-application review - preferably by the Division of Wildlife;
 2. Operational monitoring.
- b. Haulage patterns designed for minimal wildlife and vegetative disruption both on and off site.
- c. Special fence designs and/or prohibitions should be considered where potential adverse effects on wildlife habitat and migratory patterns exist.
- d. The possibility of offsets should be considered with the goal of improving habitat in off-site areas nearby to compensate for habitat loss on-site.
- e. The County should recognize potential wildlife impacts and stipulate appropriate monitoring and enforcement activities.
- f. Citizen, homeowner and mining operator surveys can be considered in monitoring wildlife impacts.
- g. State Division of Wildlife and other interested groups should be brought into discussions with applicants and homeowners early on in the decision-making process so wildlife concerns can be effectively addressed in the development of an application.
- h. Preserve and improve existing riparian habitat to the greatest extent possible through weed eradication, removal of senescent vegetation and replacement with more diverse topography, habitat and vegetation.
- i. Wherever possible, reclamation should enhance habitat and allow for wildlife corridors along the South Platte River and other streams and drainage areas, particularly when the post mining land use calls for open space or wildlife habitat.

F. ARCHAEOLOGICAL, PALEONTOLOGICAL, AND HISTORIC RESOURCES

1. Goal

To preserve and protect unique archeological, paleontological, and historic resources from damage by aggregate mining activities.

2. Overview of the Topic

Unique archeological, paleontological, or historic resources should be evaluated and protected from disturbance by aggregate mining, wherever possible. It is important to be sensitive to these situations, so appropriate actions can be taken. Federal, State, and County regulations regarding archeological, paleontological, and historic resources are applicable in Adams County.

3. Mitigation Measures

A pre-application survey of potential archeological, paleontological and historic sites should be conducted. This survey should include a review of records at the State Historic Preservation Office. If the survey indicates a unique resource does exist on-site, archeological or historic preservation experts should be provided adequate opportunity for salvage.

If mining uncovers these types of resources efforts should be made to preserve or recover them. The Denver Museum of Natural History, or an organization specified by the SHPO, should be contacted to facilitate recovery of the resources.

G. OPEN SPACE, TOURISM, RECREATIONAL RESOURCES, AND GEOLOGIC FORMATIONS

1. Goal

Minimize the impacts of aggregate mining on open space, tourism, recreational resources, and unique geologic formations.

2. Overview of the Topic

At times, aggregate mining activities have the potential for adverse impacts on open space, tourism, recreation or unique geologic formations. The potential for impacts on these areas should be evaluated when planning for an aggregate mining operation.

3. Mitigation Measures

- a. Adams County Open Space Plan and Major Drainageway Planning, South Platte River in Adams County, 1/11/01, should be consulted to determine if a proposal has the potential for impact on Adams County Open Space Lands or other adjoining County or City Open Space programs. Wherever possible, reclamation plans should strive to add connections, linkages, and land area to the Adams County Open Space network.
- b. Appropriate buffer zones from Open Space Lands should be provided for in mining plans.
- c. Line of sight impacts should be evaluated.
- d. Berming and other screening techniques (see visual impacts recommendations) should be utilized to minimize adverse impacts on open space recreational and tourism resources.

H. ON-SITE/OFFSITE HEALTH AND SAFETY

1. Goal

Assure on and off-site health and safety of citizens and employees who may potentially be affected by aggregate mining operations in Adams County.

2. Overview of the Topic

In general, concerns fall into the areas of:

1. Site safety,
2. Prevention or mitigation of geological hazards
3. Impacts on adjacent community facilities, and
4. Minimizing general impacts on human health.

This category also includes a variety of issues often characterized as off-site or secondary impacts of a mining operation.

3. Mitigation Measures

- a. Require fencing around the site to prevent unauthorized entry. Ponds and steep slopes may need to be fenced.
- b. Require operators to work with citizens, businesses, and local fire districts to assure adequate fire protection. Companies should negotiate with the local fire district regarding water storage, standards for access roads so that fire equipment can be accommodated, the utilization of compatible hook-ups, and a fire safety plan.
- c. A complete analysis by the County and State of potential geological hazards when appropriate prior to permitting an operation.

4. Monitoring Procedures

- a. The applicant, County, and citizens should attempt to agree and coordinate the monitoring of the health and safety plan before final application. Adequate time should be allowed to make needed changes in the application. The establishment of clear standards will not eliminate, but will curtail confusion over future monitoring requirements and practices.
- b. Operators and citizens should monitor road quality and load loss. A specific telephone number should be posted at the site by the operator, which citizens may call to notify the company of problems or complaints.
- c. The County should conduct thorough monitoring during the initial start-up of new mining operations and during significant changes in the existing operation. Traffic should be monitored for operator adherence to safety requirements at nearest businesses, residences, schools, school bus stops, etc
- d. The County should take multiple or significant patterns of complaints seriously. The County should have an ombudsperson assigned to take complaints.

I. TRUCK TRAFFIC

1. Goal

Maintain the quality of life and safety in residential and commercial areas while allowing for the transportation of gravel products on County, State and Federal highways.

2. Overview of the Topic

Truck traffic is a major concern to citizens, companies and the County. Truck noise, wear on roads, pedestrian and vehicle safety, and traffic volume are important to citizen and industry alike. Damage to roads may result from the passage of heavy trucks. Truck traffic safety standards are implemented and enforced through both Federal law and Colorado State statutes. The U.S. Department of Transportation (DOT) has set safety standards for trucks that apply to Federal highways. DOT standards have been adopted by the State of Colorado and have been incorporated into state statutes. The State Highway Patrol and local law enforcement are responsible for ensuring these safety standards are met. The Colorado Department of Revenue and the Colorado State Patrol conduct truck weight monitoring and vehicle inspections.

3. Mitigation Techniques

General

- a. Truck weight can be limited on roads that do not meet state standards for carrying capacity. The County currently does not have weight standards, except on bridges.
- b. Truck traffic can be limited during seasons when heavy vehicle use and water saturation make damage to roads more likely.
- c. Operators should sweep intersections where truck traffic enters public roads on a regular basis.
- d. The County should assure roads are adequate in size and specifications to carry heavy loads.
- e. Permit applicants should be required to provide road improvements, where needed, as a condition of operation. Improvements might include road widening, runaway truck ramps, special stop or crossing areas at railroads or high-risk locations, and acceleration or deceleration lanes.
- f. The integrity of the roadbed on main haul routes should be maintained. Deterioration of the road as a result of increased aggregate truck traffic should not be allowed.
- g. In those cases where road improvements are required as a condition of operation and those costs are borne by the applicant, the County should consider reimbursing the operator if other heavy traffic operations are permitted to operate on the same roads.

Routing

- a. Whenever possible, routing of truck traffic should avoid residential areas, commercial areas, schools, hospitals or other highly congested areas.
- b. Timing of truck traffic should be used to prevent congestion. Timing variations should be considered during hours when citizens are going to or coming from work, and during school bus schedules.
- c. Alternative routes should be identified so the best one can be selected at the time of permitting the operation. Alternative routes should be identified to provide options to haulers when and if normal routes are highly congested.
- d. Routing should take into consideration the distance of the mine from the end destination of the rock product. Haulers should not have to travel an unduly circuitous route that makes their product more expensive and causes the operator to be less competitive.

Loss of Loads

- a. Loss of loads from trucks during transit can create problems for motorists. Loss of load includes airborne particulates, dust and sand, and heavier rocks bouncing off of trucks.
- b. Tarps shall be required or loads wetted where loss of load is a potential due to wind or truck speed.

- c. The State should be encouraged to enforce existing laws regarding loss of load. Loss of load due to aggregate bouncing off of trucks can be handled by requiring truck operators to:
 1. Clean the lips of the truck bed.
 2. Require tight tailgates.
 3. Assure rip-rap loading is conducted in a fashion that minimizes loss of load.
 4. Strictly monitor the loading of trucks to allow only the legal amount in each load.
 5. Provide or utilize "truck-baths" to wash off loose mud and dirt prior to entry on public highways.
 6. Clean up any load lost on public rights-of-way.
 7. Provide training for truck drivers on means to prevent the loss of loads.
 8. Require all trucks to use mud flaps.
 9. Provide a telephone number for citizens to report loss of load or receive complaints.

Limiting Truck Noise

- a. Prohibit the use of jake brakes on site except in emergencies.
- b. Prohibit banging tailgates on site.
- c. Grade roads on site below surface level or construct berms to act as noise barriers.
- d. Regulate the speed of trucks to minimize operational noise.
- e. Regulate the use and volume of back-up beepers on trucks and loaders. Consider utilizing light-based warning signals if legal.

Quantity of Traffic

- a. Utilize larger trucks where feasible, to lower the volume of traffic.
- b. Implement programs to teach "driver consideration."

Alternative Transportation Methods

- a. Consider rail transportation.
- b. Consider conveyor belt transportation.

Relationship to Other Master Plans

Mines within the Urban Drainage and Flood Control District shall mine in accordance with the Technical Review Guidelines for Gravel Mining Activities Within or Adjacent to 100-year Floodplains, December 1987. The Adams County Comprehensive Plan guides the location of roads, parks, housing and businesses in Adams County. Clearly, the Mineral Extraction Master Plan must be integrated with the Comprehensive Plan so mining will not conflict with future land use.

The experience in Adams County has been that most gravel mining operations are too small for innovative reclamation ideas to be used. Linking the operations along the South Platte into a master scheme will allow more flexibility and creativity to be exercised. The South Platte River Heritage Plan contains guidance on multi-use reclamation for gravel lakes.

If a coal strip mine is ever opened in Adams County it is probable the mining and reclamation plan will cover thousands of acres. The magnitude of the operation will allow flexible reclamation, similar to what will be possible after adoption of the gravel master plan.

Over twenty Major Drainageway Planning and Outfall System Plan studies (Master Plans) have previously been published. Mining operations may significantly impact many of these drainageways. These plans, available at Adams County or Urban Drainage and Flood Control District, should be consulted before permitting any mining operation.

Cooperation with Contiguous Areas

Copies of this Plan were sent to all municipalities within Adams County, surrounding counties, the Colorado Geological Survey, and the Division of Minerals and Geology. Comments received from these agencies were incorporated into the Plan where appropriate.

Conclusion

The assurances given above show this Plan satisfies the requirements of § 34-1-301, C.R.S. et seq., and allows the Planning Commission to certify the Plan to the Board of County Commissioners of Adams County.

Adoption

After receipt of this Plan from the Planning Commission, the Board of County Commissioners shall publish notice of a public hearing. The notice will be placed in a newspaper(s) of general circulation in Adams County and will state

places at which the text and maps of the Mineral Extraction Master Plan may be examined. The notice will be published a minimum of 30 days prior to the public hearing. After the hearing the Board of County Commissioners may adopt the Plan with or without revisions, or return it to the Planning Commission for further study. If the Plan is sent back for further study, it shall not be adopted until a hearing notice has again been published and a public hearing held.

Revision and Amendment

Much of what is contained in this Plan is based on information supplied by other sources. The Plan, therefore, may be revised upon receipt of written documentation changing data used in the Plan. Such revision may be conducted at any time by direction of the Planning Director; however, all information and conclusions will be reviewed for consistency and current applicability no less than once every five years. Major revisions will be adopted only after notice has been published and a public hearing conducted. The Board of County Commissioners may also amend portions of the Plan. An example of such an action might be to add or delete an area to lands protected for future mining. This type of change would be made by Resolution based on findings of fact consistent with the adopted Plan.

Urban Drainage and Flood Control District (UDFCD) may also periodically revise the Technical Review Guidelines for Gravel Mining Activities referred to in this Plan. Although this document is included as Appendix B, mine operators are responsible for checking with UDFCD to assure they follow the most up-to-date version of the Guidelines.

Recommendations for Implementation

To fully implement this plan and fulfill its intent the following regulatory measures should be investigated and incorporated into the Adams County Development Manual where appropriate.

1. Address conservation of natural areas-
 - a. Increase setbacks of mining operations from rivers and streams
 - b. Establish a policy for on- or off-site set-aside lands to offset habitat loss
 - c. Create a land set-aside policy for public access
2. Permitting process-
 - a. Institute periodic review of Conditional Use Permits
 - b. Authorize shorter time frames on Conditional Use Permits

APPENDICES

- A. Colorado Revised Statutes, Title 34. Mineral Resources
- B. Urban Drainage and Flood Control District Technical Review Guidelines for Gravel Mining Activities

Appendix A

Colorado Revised Statutes Title 34. Mineral Resources Article 1. Geologic Survey

Part 3. Preservation of Commercial Mineral Deposits

§ 34-1-301 Legislative declaration.

(1) The general assembly hereby declares that:

(a) The state's commercial mineral deposits are essential to the state's economy;

(b) The populous counties of the state face a critical shortage of such deposits;

(c) Such deposits should be extracted according to a rational plan, calculated to avoid waste of such deposits and cause the least practicable disruption of the ecology and quality of life of the citizens of the populous counties of the state.

(2) The general assembly further declares that, for the reasons stated in subsection (1) of this section, the regulation of commercial mineral deposits, the preservation of access to and extraction of such deposits, and the development of a rational plan for extraction of such deposits are matters of concern in the populous counties of the state. It is the intention of the general assembly that the provisions of this part 3 have full force and effect throughout such populous counties, including, but not limited to, the city and county of Denver and any other home rule city or town within each such populous county but shall have no application outside such populous counties.

§ 34-1-302. Definitions.

As used in this part 3, unless the context otherwise requires:

(1) "Commercial mineral deposit" means a natural mineral deposit of limestone used for construction purposes, coal, sand, gravel, and quarry aggregate, for which extraction by an extractor is or will be commercially feasible and regarding which it can be demonstrated by geologic, mineralogic, or other scientific data that such deposit has significant economic or strategic value to the area, state, or nation.

(2) "Extractor" means any individual, partnership, association, or corporation which extracts commercial mineral deposits for use in the business of selling such deposits or for use in another business owned by the extractor or any

department or division of federal, state, county, or municipal government which extracts such deposits.

(3) "Populous county or populous counties of the state" means any county or city and county having a population of sixty-five thousand inhabitants or more according to the latest federal decennial census.

§ 34-1-303. Geologic survey to make study.

After July 1, 1973, the Colorado geological survey shall contract for a study of the commercial mineral deposits in the populous counties of the state in order to identify and locate such deposits. Such study shall be of sand, gravel, and quarry aggregate, and shall be completed on or before July 1, 1974, and shall include a map or maps of the state showing such commercial mineral deposits, copies of which may be generally circulated. Any commercial mineral deposits discovered subsequent to July 1, 1974, may be, upon discovery, included in such study.

§ 34-1-304. Master plan for extraction.

(1) The county planning commission for unincorporated areas and for cities and towns having no planning commission or the planning commission for each city and county, city, or town, within each populous county of the state, shall, with the aid of the maps from the study conducted pursuant to section 34-1-303, conduct a study of the commercial mineral deposits located within its jurisdiction and develop a master plan for the extraction of such deposits, which plan shall consist of text and maps. In developing the master plan, the planning commission shall consider, among others, the following factors:

- (a) Any system adopted by the Colorado geological survey grading commercial mineral deposits according to such factors as magnitude of the deposit and time of availability for and feasibility of extraction of a deposit;
- (b) The potential for effective multiple sequential use which would result in the optimum benefit to the landowner, neighboring residents, and the community as a whole;
- (c) The development or preservation of land to enhance development of physically attractive surroundings compatible with the surrounding area;
- (d) The quality of life of the residents in and around areas which contain commercial mineral deposits;
- (e) Other master plans of the county, city and county, city, or town;
- (f) Maximization of extraction of commercial mineral deposits;

(g) The ability to reclaim an area pursuant to the provisions of article 32 of this title; and

(h) The ability to reclaim an area owned by any county, city and county, city, town, or other governmental authority or proposed, pursuant to an adopted plan, to be used for public purposes by such a governmental authority consistent with such proposed use.

(2) A planning commission shall cooperate with the planning commissions of contiguous areas and the mined land reclamation board created by section 34-32-105 in conducting the study and developing the master plan for extraction.

(3)(a) A county planning commission shall certify its master plan for extraction to the board of county commissioners or the governing body of the city or town where the county planning commission is acting in lieu of a city or town planning commission. A planning commission in any city and county, city, or town shall certify its master plan for extraction to the governing body of such city and county, city, or town.

(b) After receiving the certification of such master plan and before adoption of such plan, the board of county commissioners or governing body of a city and county, city, or town shall hold a public hearing thereon, and at least thirty days' notice of the time and place of such hearing shall be given by one publication in a newspaper of general circulation in the county, city and county, city, or town. Such notice shall state the place at which the text and maps so certified may be examined.

(4) The board of county commissioners or governing body of a city and county, city, or town may, after such public hearing, adopt the plan, revise the plan with the advice of the planning commission and adopt it, or return the plan to the planning commission for further study and rehearing before adoption, but, in any case, a master plan for extraction of commercial mineral deposits shall be adopted for the unincorporated territory and any city and county, city, or town in each populous county of the state on or before July 1, 1975.

§ 34-1-305. Preservation of commercial mineral deposits for extraction.

(1) After July 1, 1973, no board of county commissioners, governing body of any city and county, city, or town, or other governmental authority which has control over zoning shall, by zoning, rezoning, granting a variance, or other official action or inaction, permit the use of any area known to contain a commercial mineral deposit in a manner which would interfere with the present or future extraction of such deposit by an extractor.

(2) After adoption of a master plan for extraction for an area under its jurisdiction, no board of county commissioners, governing body of any city and county, city, or town, or other governmental authority which has control over zoning shall, by

zoning, rezoning, granting a variance, or other official action or inaction, permit the use of any area containing a commercial mineral deposit in a manner which would interfere with the present or future extraction of such deposit by an extractor.

(3) Nothing in this section shall be construed to prohibit a board of county commissioners, a governing body of any city and county, city, or town, or any other governmental authority which has control over zoning from zoning or rezoning land to permit a certain use, if said use does not permit erection of permanent structures upon, or otherwise permanently preclude the extraction of commercial mineral deposits by an extractor from, land subject to said use.

(4) Nothing in this section shall be construed to prohibit a board of county commissioners, a governing body of any city and county, city, or town, or other governmental authority which has control over zoning from zoning for agricultural use, only, land not otherwise zoned on July 1, 1973.

(5) Nothing in this section shall be construed to prohibit a use of zoned land permissible under the zoning governing such land on July 1, 1973.

(6) Nothing in this section shall be construed to prohibit a board of county commissioners, a governing body of any city and county, city, or town, or any other governmental authority from acquiring property known to contain a commercial mineral deposit and using said property for a public purpose; except that such use shall not permit erection of permanent structures which would preclude permanently the extraction of commercial mineral deposits.

Appendix B

Urban Drainage and Flood Control District Technical Review Guidelines for Gravel Mining Activities



Technical
view Guide For Mii