

# Managing Land & Leases in Petroleum Industry with GIS

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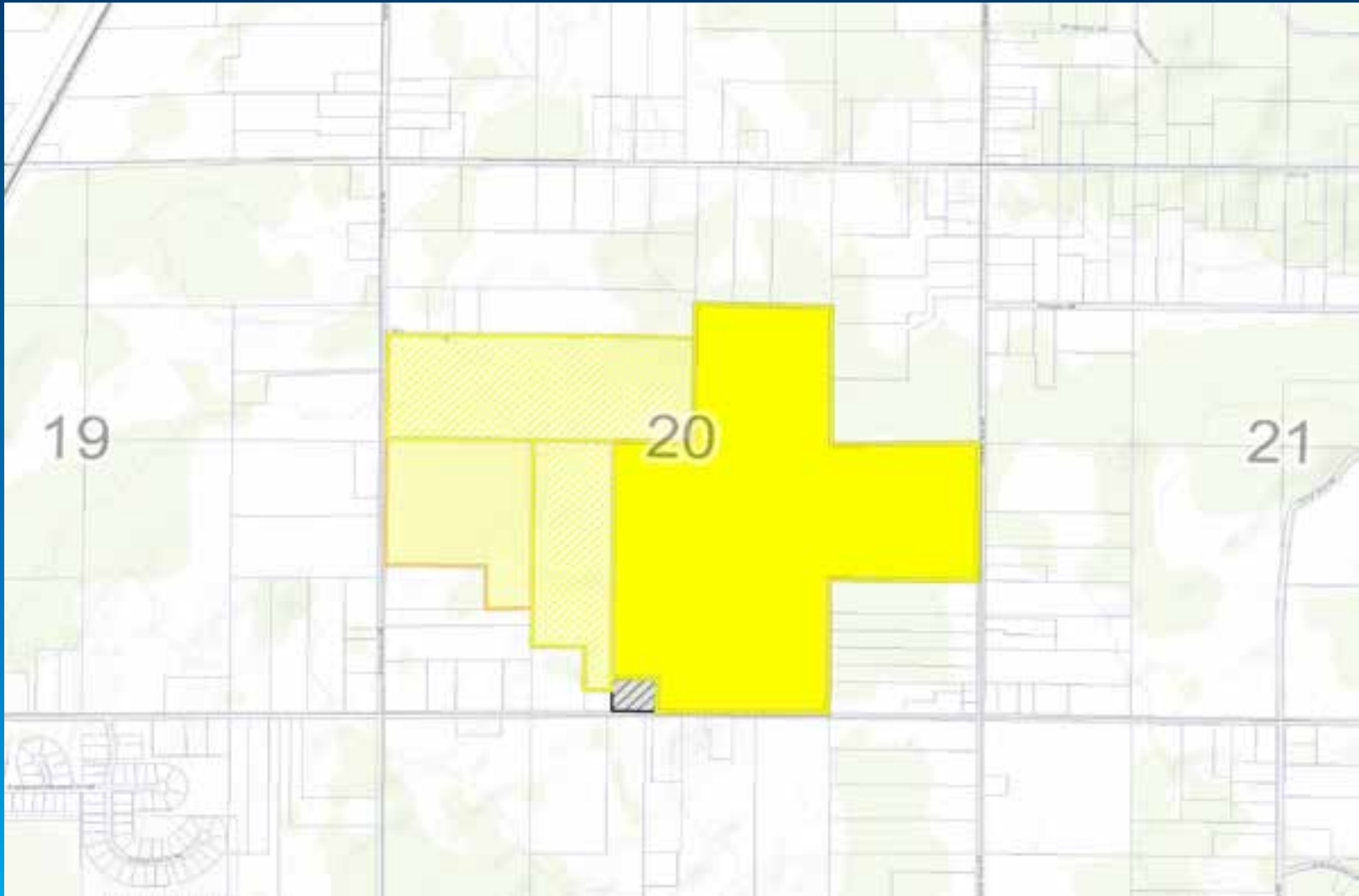
Soma Dasgupta

Rosetta Resources Inc

Houston, TX

A decorative graphic in the bottom right corner consisting of several overlapping, stylized rectangular shapes representing land parcels. The shapes are colored in a gradient from yellow to green and are tilted at an angle.

# Managing Land



# Derivation from Land Data

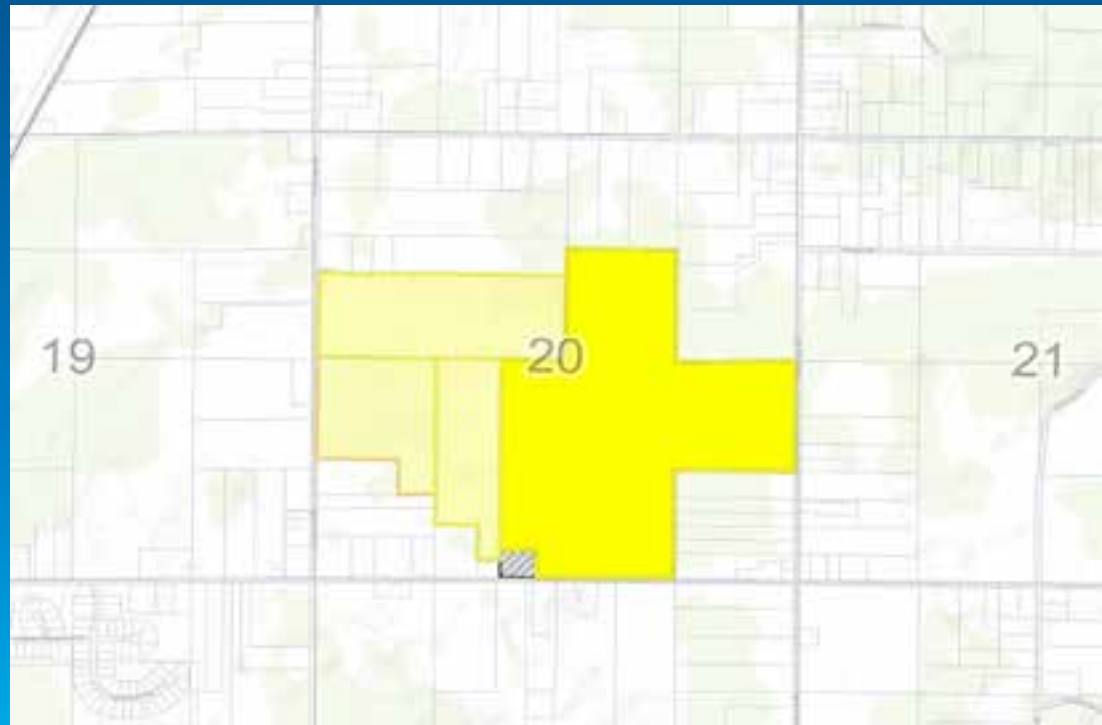
- q **Geometric data (Surveyed information)**
- q **Metes & Bounds**
- q **PLSS**
- q **Real Property Information**
- q **Tenureship**

# Utility of Plats

- q **Lease Checks Lease Purchases**
- q **Leasehold Stipulations**
- q **Title Summaries with Mineral Ownership**
- q **Well Staking with Pad Site, Gathering  
Lines, and Facilities**

# Managing Land at the LCD

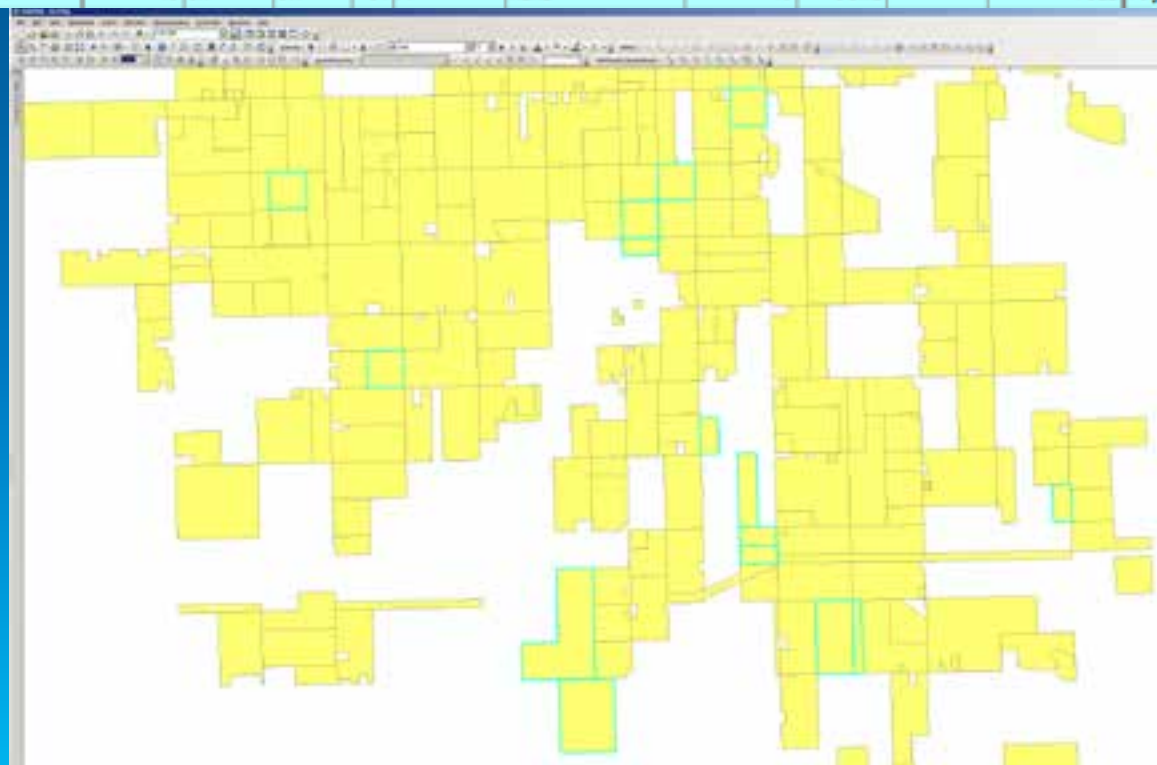
## Lowest Common Denominator



# Complexity on the Tract Level

- q **Determination of Interests**
  - q **Working Interest**
  - q **Mineral Interest**
  - q **Royalty Interest**
  - q **Net Revenue Interest**
- q **Acreage Calculation**
  - q **Gross Acreage**
  - q **Net Acreage**

OBJECTID *	TRACT_ID *	TRACT_NO	TRACT_REF	MERIDIAN	TWNSH	RANGE	SEC	SRVYTYPE	ALIQUOT	GROSS_AC	STATUS	SUBSTAT	INTEREST	SHAPE *
1280	26067-19-05N06W-10.1890	34-160-010-000-065-00	10667	19	5N	6W	10	A	W2E2SE	40	OCML		FULL	Polygon
1430	26067-19-05N06W-10.2070	34-160-010-000-020-00	10738	19	5N	6W	10	A	W2SWNE	20	OCML		FULL	Polygon
1431	26067-19-05N06W-12.2071	34-160-012-000-090-00	10743	19	5N	6W	12	A	E2SESE	20	OCML		FULL	Polygon
1435	26067-19-05N06W-14.2075	34-160-014-000-035-00	10740	19	5N	6W	14	A	W2W2W2SE	20	OCML		FULL	Polygon
1434	26067-19-05N06W-14.2074	34-160-014-000-030-00	10740	19	5N	6W	14	A	E2SW	80	OCML		FULL	Polygon
1284	26067-19-05N06W-15.1894	34-160-015-000-030-01	10667	19	5N	6W	15	A	N2NENE	20	OCML		FULL	Polygon
1283	26067-19-05N06W-15.1893	34-160-015-000-030-00	10702	19	5N	6W	15	A	S2NENE	20	OCML		FULL	Polygon
1436	26067-19-05N06W-16.2076	34-160-016-000-025-00	10444	19	5N	6W	16	A	SWNE, W2SE, SESW	160	OCML		FULL	Polygon
1439	26067-19-05N06W-21.2079	34-160-021-000-060-00	10444	19	5N	6W	21	A	W2NE, W2E2NE	120	OCML		FULL	Polygon
1226	26067-19-05N06W-3.1825	34-160-003-000-030-01	10535	19	5N	6W	3	A	N2NWNW	20	OCML		FULL	Polygon
975	26067-19-05N06W-5.1529	34-160-005-000-040-00	10278	19	5N	6W	5	S	SESW	40	OCML		FULL	Polygon
1221	26067-19-06N06W-10.1820	34-110-010-000-040-00	10789	19	6N	6W	10	A	W2NW, W2E2NW	120	OCML		FULL	Polygon
1422	26067-19-06N06W-31.2061	34-110-031-000-070-01	10437	19	6N	6W	31	A	E2NWSE, W2NESE	40	OCML		FULL	Polygon
1128	26067-19-06N06W-34.1719	34-110-034-000-025-00	10458	19	6N	6W	34	A	NESW	40	OCML		FULL	Polygon
1225	26067-19-06N06W-34.1824	34-110-034-000-045-00	10535	19	6N	6W	34	A	SWSW	40	OCML		FULL	Polygon
1312	26067-19-06N06W-34.1926	34-110-034-000-010-00	10501	19	6N	6W	34	A	NENE	40	OCML		FULL	Polygon



OBJECTID*	GIS_ID*	Lease_Name	Exp_Date	Gross_Acre	Net_Acres	Dev_Net_Acres	Mineral_Int	Royalty
29	030021010000*3091	C M KIRKPATRICK ETAL	19470922	51.65	51.65	51.65	1	0.125
30	030021010000*8135	C M KIRKPATRICK ETAL	19470922	51.65	51.65	0	1	0.125
31	030021011000*3093	SAM C CALDWELL	19460420	7.17	7.17	7.17	1	0.125
32	030021011000*8136	SAM C CALDWELL	19460420	7.17	7.17	0	1	0.125
33	030021012000*3094	A M KIRKPATRICK ET AL	19470922	22.63	22.63	22.63	1	0.125
34	030021012000*8137	A M KIRKPATRICK ET AL	19470922	22.63	22.63	0	1	0.125
35	030021013000*3095	SELWYN WHITEHEAD	19760316	40	40	40	1	0.125
36	030021013000*8138	SELWYN WHITEHEAD	19760316	40	40	0	1	0.125
45	030021015001*3137	P E NIPPER ET UX	19760927	80	80	80	1	0.125
46	030021015001*3138	P E NIPPER ET UX	19760927	38	38	38	1	0.125
47	030021015001*8140	P E NIPPER ET UX	19760927	80	80	0	1	0.125
48	030021015001*8141	P E NIPPER ET UX	19760927	38	38	0	1	0.125
49	030021015002*3140	FLORENCE JORDAN BRADLEY	19760927	2	2	2	1	0.125
50	030021015002*8143	FLORENCE JORDAN BRADLEY	19760927	2	2	0	1	0.125
55	030021017000*3144	SAM DELTON NIPPER ETAL	19760607	42.34	42.34	42.34	1	0.125
56	030021017000*8144	SAM DELTON NIPPER ETAL	19760607	42.34	42.34	0	1	0.125

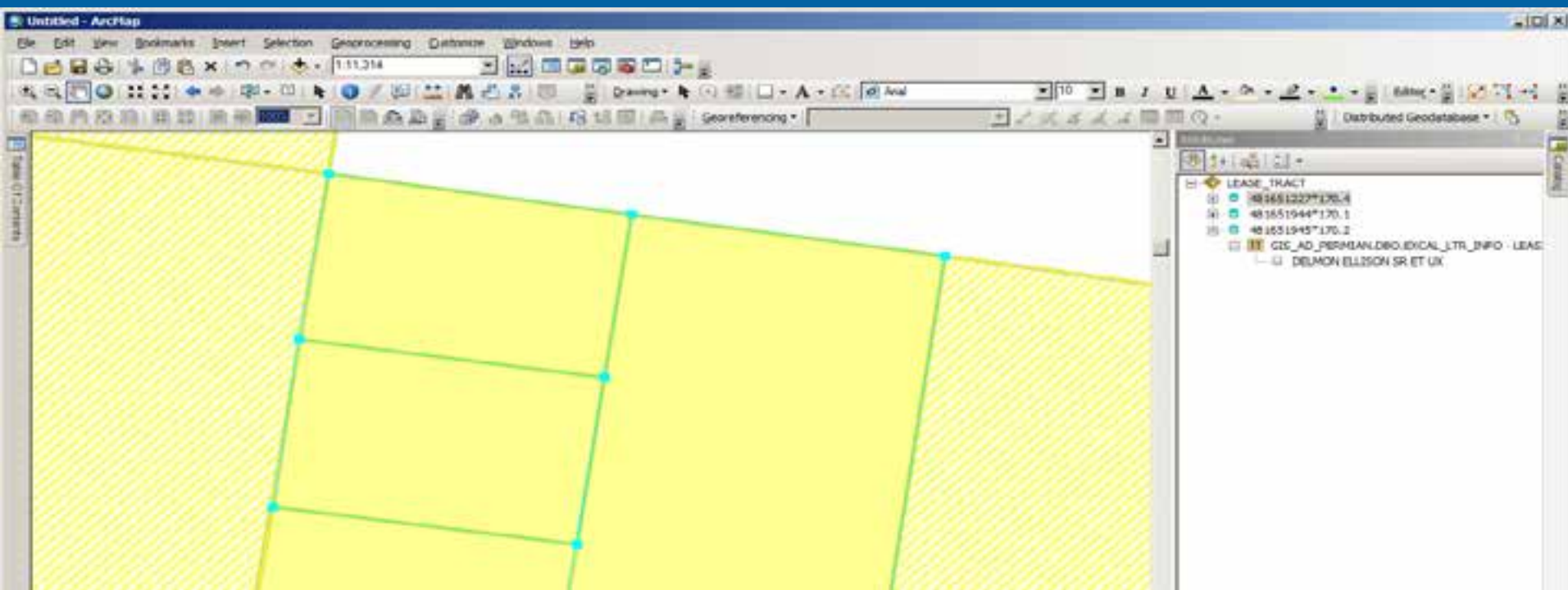


# Building A Relationship Feature Class

- q Each tract should be a portal to the surface and mineral ownership, and leasehold rights attributed to it.
- q Each unique, leasehold record should be a portal to the acreage associated with it.
- q The relationship feature class is built in order to facilitate communication, and geographically illustrate that co-dependency,

# Building A Relationship Feature Class

- q Building the relationships is very straightforward in the Editor Attribute Interface



# Building A

## Relationship

## Feature Class

- q The intermediary table produced by the many to many relationship facilitates bi-directional joins as needed.

# Building A

## Relationship

### Feature Class

- q **Summarization of mineral, working, and royalty interests on the per-tract, as well as the per-lease level is facilitated**

# GIS Ability

- q Allows to ask the Map a question to get a database  
answer: **Whose property is this?**
- q Allows the database to ask a question to get a Map  
answer: **Where is my leasehold ?**
- q Additional Tables can be Related for further  
information

# Points to Take Away

- q **Land data is key to property rights but also to many other development needs**
- q **Collect once - use many times**
- q **Model or Planning tool towards future development**

**Comments!!!**  
**Questions??**

