REFERENCES ACROSS THE ASSET LIFE CYCLE
For the chemical & life science market sector
Contents

2 The Asset Lifecycle
9 Capex Projects Manufacturing
21 Capex Projects R&D (Including Labs)
31 Capex Projects Office / CRE
44 Opex Optimization Projects
59 M&A Transactional Projects
62 Product Stewardship Projects
67 Compliance / Regulatory Driven Projects
91 Decommissioning / Divestment / Closure Projects
The Asset Lifecycle

- Redefining
- Creating
- Operating
- Planning
Delivery of sustainable operational savings through integrated working
Optimizing clients operational expenditure by reducing excessive costs through the bespoke assessment, design and implementation of operational excellence.

OpEx Optimization unlocks the maximum benefit from client operations.

<table>
<thead>
<tr>
<th>Category</th>
<th>Benefit %</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHS &amp; PROCESS SAFETY</td>
<td>-10%</td>
</tr>
<tr>
<td>MAINTENANCE OPTIMIZATION</td>
<td>-10%</td>
</tr>
<tr>
<td>WATER SUSTAINABILITY</td>
<td>-5%</td>
</tr>
<tr>
<td>ENERGY EFFICIENCY</td>
<td>-40%</td>
</tr>
<tr>
<td>WORKPLACE SOLUTIONS</td>
<td>-10%</td>
</tr>
</tbody>
</table>

- Effective Processes that personnel can align to that do not hinder production
- Maintenance processes that are cost effective and not just routine
- Water management processes that deliver better efficiency and energy usage outcomes
- Effective operations that minimizes energy usage
- Defining optimum workplace solution that deliver holistic benefits.
Five secrets to successfully optimize your capital expenditure

Rapid expansion in emerging markets, legacy asset condition issues, and continuous cost reduction pressures are just some of the major challenges facing chemical and life science organizations. M&A remains a viable growth strategy for organizations looking to stay ahead of the competition however with the investment cycle getting faster, the delivery of projects is becoming more complex.

This is placing chemical and life science businesses under greater pressure than before to try and maximize the return on their capital investments. Today many Capital Projects Directors are being asked to achieve more, often with less resource, and so the need to have a greater certainty of outcome on capital projects that do go ahead becomes ever more important.

Managing Capital Costs – A Growing Challenge:

’Problem projects’ can often spiral out of control very quickly, resulting in significant overruns in terms of cost and schedule. Common root causes include:

- Unrealistic budget targets/ timescales
- Customer requirements are unclear, uncontrolled and changing
- Lack of access to local knowledge
- Ineffective governance and control
- Limited supplier capability
- Health & Safety standards are inconsistently applied
- Lack of influence over local teams and business units.

As this challenge grows, chemical and life science organizations need to partner with a capital delivery organization that can bring knowledge, experience, governance systems and innovative technology solutions.

All of this can help them better manage budgets and ensure that resource constrained programs can be delivered locally on time, to budget, and to a quality that meets global standards.
Secrets to successful project delivery

There are typically five key steps that help ensure capital programs are delivered successfully.

THINK PROGRAM NOT PROJECT
- Adopting a program approach is more efficient and delivers greater benefits
- Set up program management offices and appropriate control systems
- Seek supply chain consolidation.

USE SMART DATA TO BENCHMARK
- Set 'should-cost' benchmarks
- Implement client-led BIM solutions
- Apply product and asset knowledge.

DRIVE INNOVATION IN SUPPLY CHAIN MANAGEMENT
- Ensure early engagement with contractors, sub-contractors and designers etc.
- Off-project innovation
- Back to back incentives.

CREATE THIN, INTELLIGENT CLIENT MODELS
- Focus on outcomes and governance
- Surround yourself with the right delivery partners
- Establish lean teams.

PROVIDE PERFORMANCE ASSURANCE
- Protect your brand and manage reputational risks from extended supply chains
- Minimize environmental liabilities
- Improve commercial results.
Secrets to successful project delivery
There are typically five key steps that help ensure capital programs are delivered successfully.

Key Benefits

A. SIGNIFICANT CAPEX SAVINGS:
Up to 20% cost savings have been achieved through investment planning, value management, supply chain and change management.

B. GUARANTEE OF GLOBAL STANDARD:
By integrating our technical, program and commercial knowledge with a deep understanding of what will bring you competitive advantage, we can design, assure, deliver and improve capital investment and delivery at a local or global level around the full investment lifecycle.

C. CERTAINTY OF DELIVERY:
Drawing on our local market, sector, legislative, economic and cultural knowledge, and established relationships, we help you to get your assets built efficiently.
Multiple pharmaceutical facilities

Client’s Challenge
Facilities that meet manufacturing and production needs in China.

APPROACH
• Our approach has included comprehensive commercial management, both pre and post contract as well as strategic cost estimating, reviews and monitoring.

VALUE CREATED
• Provided commercial skills and expertise for over RMB 900 million of investment, and covering 130,000sqm of floor area for a range of workplaces, pharmaceutical plants and extensions, and packing / receiving centers across China.

Location
China

Client
AstraZeneca

Services
Cost Control and Contract Management
Gaining Market Share with Expansion for New Product Manufacturing

Client’s Challenge
Build new production capacity efficiently to meet growing market demands.

APPROACH
- For the production of propylene oxide a brand new HPPO factory had to be built on a tight time schedule.
- BASF Antwerp needed extra surveyors and construction experts to follow up, analyze and register cost calculations.
- Arcadis managed the complete cost control and construction realization from beginning to end and the plant was successfully expanded.

VALUE CREATED
- Restrained budget overruns in difficult variable project settings and conditions.
- Timely delivery so production could speed up and client could gain more market share.

Location
China

Client
AstraZeneca

Services
Cost Control and Contract Management
Cleaner and More Efficient Production in China

Client’s Challenge
Construction of new toluene diisocyanate (TDI) production facility with lower operating costs and carbon dioxide emissions.

Location
Shanghai, China

Client
Bayer

Services
Project Management

OPERATING

APPROACH
• Managed costs and continued improvement in the systems, processes and internal communication resulting in best value procurement and on the appropriate scope of works.

VALUE CREATED
• Costs were managed with the project completed within the client’s budget. The investment costs 20% lower than benchmark data.
• “No surprises” in the final accounts which were agreed at the time of contract completion.
• Procured to maximize tax position of client
• The technology used reduces the solvent use by 80% compared with similar sized facilities resulting in lower operating costs and carbon dioxide emissions reduced by 60,000 tons a year.
Client’s Challenge

Reshaping the business location of Chemelot in Geleen to render it suitable as a business location for the service providers of DSM, to create the right conditions for a thriving Research and Business Campus and to diversify the accessibility of the site.

APPROACH

• In order to develop the zoning plan results of research have been included on spatial planning, traffic, soil, water, air, noise, flora and fauna and archaeology.
• The master plan included several planning aspects, opening up the area, soil hydrology investigation, utilities relocations, green structure design and geo-technical, environmental and ecological aspects.

VALUE CREATED

• Successful collaboration between Chemelot and the municipality of Geleen by meeting needs of both stakeholders.
• A zoning plan and civil engineering master plan that covered all 400 hectares of the Chemelot site.
• Acquired more than €12m in subsidy for these projects.
Providing Certainty for Delivering Projects Locally

Client’s Challenge
Support the leading research-focused healthcare giant in their efforts to enlarge the production capacity for their products in the Asian and Global market.

Ensure that the same high standards of Roche Pharmaceutical are carried through in the Phase II expansion of the operating site and increasing market demand for life-saving cancer drugs can be met.

APPRAOCH
• In order to achieve this, we need to identify the key individuals within the Arcadis umbrella of companies operating in China and elsewhere to supply expert resources in Project Management, Document Control, Scheduling, Lead Engineer and Quality Controls, assisting Roche Pharmaceutical to meet its goals.

VALUE CREATED
• Successful placement of key personnel augmenting Roche Pharmaceutical staff during the duration of the project has contributed to the current success of the Phase II of the Project.
• Met aggressive schedule targets as a result of effective communication and coordination among project teams.
• Ensured the highest quality level by delivering program-level management to the project and implementing best practice.
• Optimized energy performance and minimized environmental impact.

Location
Shanghai, China

Client
Roche

Services
Project Management Permit Management
CSA Supervision and Engineering Management
Project Management for Building Transformation

Client’s Challenge

Transforming a commercial building to host a bioprocessing plant.

APPROACH

- Fill out of an existing commercial building to host a bioprocessing plant. Arcadis provided end-to-end management of the project including construction, equipment readiness, manufacturing readiness, commissioning, qualification and validation of the facility.

VALUE CREATED

- Arcadis helped building the project schedule in MS Project for all activities leading to release of the facility for manufacturing.
- Updated project schedule and tracking activities, action items and milestones
- Facilitated decision making process
- Coordination of design, construction and validation documentation
- Coordinating timely and satisfactory quality turnover packages from the external contractors
- Project updates on a daily basis with all sub-team leads
- Tracking and managing all punch lists during construction, commissioning and validation
- Provided summaries for steering committee presentations
- Assisted the financial oversight to track and manage all project costs.
Helping to Deliver the Bio Flu Vaccine Production Facility in Dresden

Client’s Challenge
Managing expansion of production facility on flu vaccine production within budget.

Location
Dresden, Germany

Client
Confidential

Services
Contract Management

Creating

Approach
- Arcadis worked in close cooperation with a multinational pharmaceutical company on procurement management for the expansion of their flu vaccine production facility in Dresden. We worked on benchmarking and risk management of running and completed a multinational pharmaceutical company’s projects worldwide.

Value Created
- Developed a claim management strategy
- Minimizing cost by excellent management.
Major Time-Critical Facility Expansion

Client’s Challenge
Major expansion of corn seed production facility, quadrupling the annual capacity to meet market demand.

Location
Formosa, Brazil

Client
Confidential

Services
Project, Program and Cost Management
Health & Safety Management

APPROACH
- Provision of a full-time on-site dedicated team
- Strong client and consultant shared responsibility and accountability
- Flexible teamwork, with up to 20 staff involved
- Clear focus on construction management and a high level of health and safety awareness.

VALUE CREATED
- Smooth running of high-profile and substantial new investment project
- Exemplary health & safety management & coaching
- 1 Million man-hours worked with no lost time incidents (to Feb 2015)
- Key advisory and support on debottlenecking supply chain and contractual issues
- Creative approaches to keep budget and timelines on target.
Client’s Challenge

Provide a reliable on-going utilities service to a secondary manufacturing facility, to allow delivery of project knowledge and drugs for clinical trials.

APPREACH

• Consolidation of 22 air handling units (AHUs) down to 9 AHUs, including modifications to associated mechanical and electrical services and replacement controls while maintaining operations.

• Creation of a schedule that allowed the building to operate and then changed at the request of a multi national pharmaceutical company to accommodate critical manufacturing activities. The schedule implemented over a 3 year phased period with pilot plant operations continuing throughout the project, with no 2 critical areas being taken down at any one time.

VALUE CREATED

• Providing a robust heating and ventilation system that serves a critical GMP building

• Consolidated engineering plant vacating plant room space

• Operational energy cost savings of £300k per annum

• 2300 tons of CO savings per annum.
Filling Project Expertise Needs with Qualified Arcadians on Location

Client’s Challenge
Finding external talents in project management, construction management, design and engineering to fill the technical needs on a project by project basis.

APPRAOCH
- Consolidation of 22 air handling units (AHUs) down to 9 Arcadians are located on site filling positions of project managers, cost managers, administrative people and designers.
- The Client has appointed Arcadis as Construction Coordinator for construction support and project management during the execution phase of all civil and technical projects on site.

OPERATING

VALUE CREATED
- Awarded ‘Best Supplier Award 2012’ for performance related to construction, site infrastructure, mobility and product stewardship
- Developed a dashboard for managing execution of projects in a more efficient way
- Balanced workload for the client’s project management office during construction phase.

Location
Belgium

Client
Confidential

Services
PM/CM Service
Outsourcing of Capital Program

Client’s Challenge
Outsourcing of Capital Program

APPROACH

- The scope of work includes fit out of an existing commercial building to host a bioprocessing plant to produce drug substances for phase II-III clinical trials.
- The new facility consists of bio-production clean rooms, including inoculum and scale-up room, 50 Liters, 200 Liters and 2X1000 Liters single-use bioreactors for cell culture, harvest by filtering and/or centrifuging, product initial purification using Affinity and Ion Exchange chromatography and column packing, final purification by Ultrafiltration/ Diafiltration, final product staging, autoclave and washer, weighing and dispensing, cell banking, raw material sampling and environmental rooms and warehouse.
- Arcadis provided end-to-end project management including construction (primary interface for schedule updates with the project manager from the construction company), equipment readiness, manufacturing readiness, commissioning, qualification and validation of the facility.

VALUE CREATED

- We helped build the project schedule in MS Project for all activities leading to release of the facility for manufacturing.
- In addition we also: 1) updated project schedule and tracked all activities, action items and milestones. Coordinated core team and sub-team meetings, compile action items and track progress; 2) facilitated decision-making process by bringing the stakeholders together and providing clear problem statements and identifying paths forward; 3) coordinated all design, construction and validation documentation; 4) took responsibility for coordinating timely and satisfactory quality turnover packages from the external contractors; 5) worked on a daily basis with all the sub-team leads on project updates; 6) tracked and managed all punch lists during construction, commissioning and validation; 7) provided summaries for steering committee presentations; and 8) assisted the financial oversight team to track and manage all project costs.
CAPEX PROJECTS
R&D (INCLUDING LABS)
Creating A Safe Laboratory Working Environment

Client’s Challenge

Provide safe working conditions for staff involved in quality assurance of chemical processes

Location
Rozenburg, The Netherlands

Client
Arco

Services
Building Design and Engineering Services

CREATING

APPROACH

- FEM calculation techniques were used, reproducing a dynamic modelling of the explosion load, to arrive at an economical solution creating a blast-proof laboratory.
- To meet the accelerated time frame, prefabricated sandwich panels were poured together on site.

VALUE CREATED

- A building that complies with the highest safety demands and is continuously electronically monitored for gas leaks and risk of explosive gas mixtures resulting from activities within the building.
- The light construction techniques have the advantage of greater transformation capacity, whilst maintaining sufficient strength to transport the design load to the walls.
Laboratory Infrastructure Mannheim (LIM)

Client’s Challenge
Extend current capacity within the laboratory infrastructure with a new building for laboratories and offices with a gross area of 28,000 sqm on nine levels.

APPROACH
Construction Management at agency and Project Controls. Arcadis’ construction Management team is responsible for the delivery of the project in time and within budget
• Construction oversight
• Coordination of the tendering process
• Coordination of timely delivery of contractor’s deliverables
• Contract Management
• Scheduling
• Cost controls
• Health & Safety
• Quality control
• Risk assessment and management including implementation of corrective actions
• Testing and Commissioning
• Coordination of close out activities

VALUE CREATED
• Delivery on time and within the budget.

Location
Mannheim, Germany

Client
Roche

Services
Construction Management,
Project Controls Engineer
(Cost Controlling and Scheduling)
Embodiment of Scientific Collaboration, Technology Architectural Excellence and Sustainable Design

Client’s Challenge
Creating a new campus that represents the ideals and ambitions of the new authority and reflects its stature in the Kingdom and in the region.

APPROACH
- The master plan envisions a richly articulated environment of indoor and outdoor pedestrian spaces that will encourage interaction and chance encounters among the SFDA scientists, in addition to structured research. Courtyards, atria and gardens are arranged along a central main street that will define the social dimension of the new agency.

VALUE CREATED
- A campus that reflects the regional climate, landscape, and historical context of Riyadh.
- Special emphasis is placed on the response to the harsh desert climates – intense sunlight, extreme heat, and temperature variations, aridity, and periodic dust storms.

Location
Saudi Arabia

Client
Saudi Food & Drug Authority

Services
Master Planning, Architectural Design, Programming, Strategic Planning, and Workplace Guidelines
Integrated Approach to Global Capital Project Delivery

Client’s Challenge

Integrated consistent approach to capital project delivery across client’s UK & U.S. portfolio that is focused on performance and achievement of strategic objectives.

APPROACH

- Arcadis is providing project management services for a confidential pharmaceutical client. This single provider approach provides this client with access to benefits and value that would not be possible with multiple partners, and a meaningful and mutually beneficial partnership between both organizations.

- This approach also provides resource efficiencies and cost reduction; consistency in delivery across the portfolio; development of global systems, benchmarks and norms to drive continuous improvement in the capital plan performance; and acceleration of the client’s transformation agenda.

- In addition, other benefits include improved integration with other business partners, reducing operational risk and improving user satisfaction; and increased accountability for and ownership of delivery by Arcadis.

VALUE CREATED

- 1,000,000 hours of no lost time injuries, earning a Merit International Safety Award
- 350 projects successfully delivered
- 15% improvement in forecasting accuracy.

Location
United Kingdom and United States of America

Client
Confidential

Services
Project Management

© Arcadis 2015
Renovating Mission-Critical Facilities with No Downtime

Client’s Challenge
Complete necessary, time-critical ‘clean room’ renovations in accordance with international standards while securing business continuity.

Approach
- Provided consulting expertise on cleanroom technologies design according to local standards and assisted in the tendering and contractor selection for the project implementation. The project was phased so that all existing production activities remained on-line, resulting in no downtime.

Value Created
- Getting the product to the U.S. market without delay by ensuring compliance with international construction standards
- Eliminating the potential of production downtime.
Helping a multi national pharmaceutical company Meet R&D Goals through Laboratory Consolidations

Client’s Challenge

Co-locate the Biopharm R&D operations at Stevenage to support the business objective of delivering 20% of Pharma R&D’s significant indication launches by 2015.

Approach

• Delivery of a new “Flexi Lab” laboratory, office, meeting room and breakout facilities within an existing facility at a multi national pharmaceutical company’s Stevenage campus and final relocation of Biopharm R&D organizations from 9 locations at Stevenage and Harlow into a single final location.

• Arcadis focused on the engagement and management of key stakeholders within the Biopharm business and facilitated the relocation of teams and introduction of a new way of working in terms of smart working and reduced sqm / person.

Value Created

• Consolidation of dispersed Biopharm teams to the new smart working principles, ultimately supporting the Biopharm business plan

• Freed up 1,700sqm of floor space within the existing estate to support future expansion or site relocations.

Location

United Kingdom

Client

Confidential

Services

Project Management
R&D Capital Projects Partner

Client's Challenge
Management of £100+m capital expenditure program for all R&D facilities to meet R&D evolving needs across laboratories, pilot plants, plant and engineering infrastructure and workspace.

Value Created
- Resource savings of 40% through our single shared services model
- Streamlining into centralized single team
- Consistent approach shared across all business units
- Intimate insight and understanding of R&D within a leading research based pharmaceutical and healthcare company.

Approach
- Since 2009 we have been the lead partner to a multi national pharmaceutical company Research & Development in the UK, providing planning, governance, project controls, health & safety, project and commercial management for their capital investment program.

Location
EMA and U.S.

Client
Confidential

Services
Capital Expenditure Consulting
Delivering Best in Class Project Control Management Tools

Client’s Challenge
Increase operational efficiency for global R&D capital investment program.

APPRAOCH
- Roll out of our project controls portfolio management tool covering all of a multinational pharmaceutical company R&D’s capital investment program.

VALUE CREATED
- Multiple legacy systems retired and £1 million annual IT support costs avoided
- Single tool serving all stakeholder interests
- Best in class methodology, with bespoke flexibility
- Low maintenance compared with proprietary systems
- Status available for all projects across all KPIs
- Data can be filtered to any level at any time – channeled to priorities
- Ease of use for complete team – from PMs to Portfolio Executive
- Fully audit trail with automated approval processes.

Location
UK and U.S.

Client
Confidential

Services
Governance, Capital Planning, Project Controls
Delivering Best in Class Project Control Management Tools

Client’s Challenge
Establish lead R&D campus in China to attract best talent and create another global research hub. Manage transition from project to operations and ensure operational readiness.

Location
Shanghai, China

Client
Confidential

Services
Project Management, Business Advisory

Value Created
• Our independent view provided an unbiased overview, priorities and actionable recommendations for the Asia-Pacific Real Estate organization moving forward into the operational phase. We helped to identify major risks and how to mitigate them in order to avoid potential future interruptions during operation and minimize surprises from the construction phase of the project.

Approach
• Leveraging our skills and expertise in Project Management, property assessment and FM consulting in China and Europe we assessed the campus buildings concerning the status and progress of handover, defect management and set-up of facility operations.
CAPEX PROJECTS
OFFICE / CRE
Branding a Workplace Environment

Client’s Challenge
Strengthen organizational identity.

Location
Washington, D.C.

Client
American Society of Hematology

Services
Interior Architecture and Design, Technology Design

CREATING

APPRAOCH
• Created a workplace for the employees and representing the Society’s members who are the heart of the organization. Responded with an environment that is open and filled with light.

VALUE CREATED
• The project is certified LEED Platinum
• Created a multipurpose conference center
• An open, light space that reflects the employees and ASH members.
Designing Agency’s New Headquarters

Client’s Challenge
Strengthen organizational identity.

Location
Maryland, USA

Client
Food & Drug Administration

Services
Architectural Design

CREATING

Value Created
- Improved overall space utilization and more interaction is encouraged among the FDA’s core divisions
- Reinforces the FDA’s mission of enhancing cross-disciplinary collaboration while also respecting the private and confidential nature of the organization’s work
- Featuring overall LEED certified buildings.

PlANNING

Approach
- Consolidating 9,000 employees from 40 buildings in 18 locations on one 130-acre campus.
Modernization of Pfizer Headquarters in Brussels

Client’s Challenge
Refurbish 6,900sqm over six stories while maintaining a productive and safe working environment for approximately 400 employees.

APPROACH
• Meticulous planning to execute the work, floor by floor, with forced cost and project management at every stage.

VALUE CREATED
• 750 relocations completed within eight months – on schedule and within budget
• Efficient and effective use of office space by transitioning work cubicles into an open floor plan.

Location
Brussels, Belgium

Client
Pfizer

Services
Project Management
Development of New Regional Middle East Headquarters

Client’s Challenge
Create a new regional headquarters located in Dubai to develop stronger partnerships with healthcare companies across the region and improve efficiency savings by merging three existing offices into one.

OPERATING

Address
Dubai Media City, UAE

Client
Pfizer

Services
Project / Cost / Move Management

APPROACH

• Feasibility study to identify suitable buildings for the company
• Negotiations with landlords
• Design and build contract was adapted
• A four-stage phased approach was used to migrate individuals into the new office.

VALUE CREATED

• Consolidation of three existing buildings and relocation of 250 employees lead to a significant reduction in global operational expenditure.
• The building was recognized by the TECOM Business Parks Sustainable Energy & Environmental Division for its minimal impact upon the environment.
• Delivered on time and business continuity was achieved by phased migration of employees.
Office Relocation for Pfizer in Bucharest

Client’s Challenge
Relocate their office to a new space to meet their existing business needs and company organization goals.

Location
Bucharest, Romania

Client
Pfizer

Services
Project Management

OPERATING REDEFINING

APPROACH
• Managed the relocation process, in addition to negotiating, arranging and managing the fit out of the space as well as the procurement and supply of equipment and furniture
• Management of local team during move through workshops and seminars
• Assembly of internal work streams within the client’s organization to address specific relocation concerns.

VALUE CREATED
• Negotiating competitive pricing for fit out works of office space and equipment supply
• 20% savings delivered.
Creation of Country Head Office in Jeddah

Client’s Challenge
Relocate two existing Jeddah offices into one new Country Head Office, within the prestigious 37 story Kings Road Tower to provide 3,800 sqm of mixed use office space.

Location
Jeddah, Saudi Arabia

Client
Pfizer

Services
Project / Cost / Move Management

CREATING

APPROACH
• Establishment of clear project brief
• Ensure adherence to processes put in place
• Introduction of robust reporting structure
• Full visibility of the project maintaining open channels of communication between all members of the project team.

OPERATING

VALUE CREATED
• Change control process resulted in potential cost and time implications being mitigated
• Forward planning and the introduction of a ‘problem solving’ attitude amongst the project team resulted in the project constraints of time, cost and quality being met in all respects
• Early procurement of a design and build main contractor enabled a rapid start on site following site hand over.
High-profile Research and Office Campus

Client’s Challenge

Pfizer Global Engineering (PGE) engaged Arcadis to Project Manage the design, construction and change management processes for their new 5-floor 10,000sqm Beijing head-office.

LOCATION

Beijing, China

Client

Pfizer

Services

Project Management Move Management

OPERATING

Value Created

- Arcadis worked together with the GO team to develop change management processes and train employees to enable the smooth transition of business operations to the new facility.
- Arcadis was effectively able to renegotiate the design-build firm’s quotations retroactively in order to reduce project expense and in conjunction with PGE and Pfizer Worldwide Procurement (WWP) teams Arcadis conducted formal market research and tendering to identify suitable project partners.

APPROACH

- Consolidation of several existing offices in to a single facility with an significant increase of facilities such as a 4,000sqm training area, meeting spaces, games room and a 150sqm IT data center for their China operations
- Resources: Senior Move Manager and Move Managers.
Extension of Headquarters

Client’s Challenge
Doubling the size of Shire’s HQ for growth and optimizing their wider real estate portfolio.

Location
Basingstoke, UK

Client
Shire

Services
Services Project Management

CREATING

APPRAOCH

• We provided project & cost management, contract administration, technical quality monitoring, CDMC, workplace strategy, capital allowances for the design, construction and fit out of a new office facility.

• From the inception of the project we identified key decision makers, work stream heads (e.g. FM and IT) and their key project success criteria and obtained their contribution / buy in.

• Our approach of using a specialist base build contractor and a specialist fit out sub-contractor provided a consistently high quality finish to both elements of work.

VALUE CREATED

• The move significantly reduced the square footage of Shire’s lease property, leading to release of rental space and occupation of freehold property.

• BREEAM rating of very good, meeting the client’s social responsibility aspirations and improving the buildings future rental / sale potential.
Establishment of New European Office

Client’s Challenge
Following the take-over of the petrochemical activities of DSM, SABIC wanted to establish a new European main office.

Location
Europe

Client
SABIC

Services
Project Management and Total Engineering

CREATING

APPROACH
• Arcadis was responsible for project management and total engineering
• Intensively managed costs with a comprehensive site selection and integrated approach management.

VALUE CREATED
• Saved at least €5 million for SABIC
• A dynamic, collaborative workplace where employees feel at home and which distinguishes SABIC in the market
• A special HQ building with a characteristic look, a landmark in the landscape.
Successful Relocation of 1000 Employees and 20,000sqm Stack

Client’s Challenge

One of the leading international pharmaceutical companies needed support in integrating a newly merged business and introducing a workplace strategy solution to their European strategic head office in Paris.

The challenges of this project were to fit the stretch target time line coupled with a tight project budget. The cultural diversity between the client and the final users was also a big challenge, to accommodate the diversity of intentions and objectives.

Approach

- We structured and arranged our team to ensure a consistency of process and reporting to the client. The primary success factor was to dedicate a team to the relocation works to follow the users needs on a day-to-day basis such as network, printing, archives, transfer, etc.

Value Created

- Completion 1 month earlier than contractual program
- Final budget under targets set
- Ensured consistency of operation and no disruption to day-to-day business
- Increased the workplace environment by outsourcing the storage of 1km of archives
- Met critical Client’s business integration deadlines following merger.

Location
France

Client
Confidential

Services
Project Management, Cost Management, Relocation Management
Consolidate Office Workspace Footprint in Belgium

Client's Challenge

Consolidate three decentralized offices into one office for 500 employees in Brussels which is easily accessible for employees and visitors in Belgium and abroad.

Location
Belgium

Client
Confidential

Services
Project Management, Feasibility Study, Design and Engineering (basic design), Construction Management, H&S

CREATING

APPROACH

• Arcadis was appointed to investigate the viability of the project by making a feasibility study with a pre-design for the M&E-installations, civil works and modifications on the surroundings. In a second stage Arcadis performed the full basic design in order to appoint a contractor for the Design-and-Build-stage, where we continued with quality control and construction management during the execution. Arcadis was also responsible for H&S design and supervision.

VALUE CREATED

• A pleasant working area with technical installations, that can ensure current day comfort conditions
• LEED certification.
Improving Global Real Estate Performance by Supplier Selection

Client’s Challenge
Improve the performance of real estate while shifting from a tactical to a strategic focus.

OPERATING

APPRAOCH
Based on our experience we were ideally placed to provide recommendations on the optimal outsourced structure and lead the procurement exercise. The portfolio extended to 2 million sq. m. globally and our services included defining the brief, drafting and issuing RFP documents to preferred parties, evaluation, interviews, fee analysis and business case support.

VALUE CREATED
• Leverage resource levels, tools and pricing on a global level
• Negotiating new contracts
• Cost saving of 15-20% on transaction projects across all regions.
OPEX OPTIMIZATION
PROJECTS
Global Water Management

Client’s Challenge

Seek state-of-the-art solutions for sustainable water use that minimize water footprint and enhance water quality compliance both now and in the future at over 50 facilities globally.

Location
Global

Client
Merck

Services
Water Management

CREATING

APPROACH

• Evaluate and develop strategies for more efficient water use and treatment at their facilities in the U.S., Europe and Asia
• Innovations identified by this portfolio of projects are driving sustainable water use at Merck while reducing operating costs.

VALUE CREATED

• Enable client to be a cost-competitive provider of high quality products and be a global health care leader in the marketplace
• Achieve corporate sustainability objectives and add value to the bottom line of the business.
Client’s Challenge

Develop an Energy Efficiency Plan as required under the agreement with the Dutch ‘Meerjarenafspraak (term agreement)’ for the period 2017-2020. Update of the Energy Efficiency Plan is required every 4 years.

APPROACH

• Client appointed Arcadis to develop an Energy Efficiency Plan, including energy consumption analyzes for the site and the production processes; energy management, process flows of the energy measure process and a plan of the energy measures (energy efficiency, chain measures and sustainable energy).

• In close cooperation with PFW Arcadis scanned the plant and processes for energy efficiencies and measures. In addition Arcadis reviewed interfacing subjects and wrote the plan according to the local legislation.

• Discussions and agreement with the local government agencies.

VALUE CREATED

• Developed an Energy Efficiency Plan, including sound argumentation on possibilities in compliance with local legislation

• Client could focus on their core processes

• Optimized energy performance

• Identification of energy savings where possible.
Improve Water Savings by Peer Reviews

Client’s Challenge
Push the needle from plus 50% to minus 50% water savings in new to be build pharmaceutical and consumer goods manufacturing sites, in order to meet the company’s sustainability targets.

Location
Asia

Client
Confidential

Services
Water Advisory

CREATING

APPRAOCH
• Arcadis’ water professionals from U.S., Belgium and Asia reviewed thoroughly basic and detailed designs of the new production plants including water balance and conservation measures, elaborated by the appointed engineering firm. The Arcadis’ team triggered the client’s and engineering firm’s experts and was able to optimize the already designed water re-use and loop closing measures and listed additional potential water savings. The problem became more challenging due to the location of one of the new plants in a water stressed area in Asia.

VALUE CREATED
• Additional potential water savings than the already designed ones. The client’s target to push the percentage of consumed water to be discharged, below 50% was met. In the case of the new plant in the water stressed area, our water experts were able to identify additional 15% water use reduction and major Capex and Opex savings.
• Based on these pilot cases, the client will integrate independent water experts in the design teams and already in the front end of the design process.
Client’s Challenge

Reducing operational costs and enhance performance and productivity to remain competitive in an increasingly challenging market.

APPROACH

- Aligning risk, maintenance operations and costs to business strategy
- Increasing labor efficiency and waste reduction
- Optimizing maintenance and operations processes
- Supply chain consolidation and improving commercial management
- Global estimating & benchmarking
- Technology platform to bring transparency & efficiency to estimating
- Program level management.

VALUE CREATED

- We reduced maintenance costs whilst raising asset performance, bringing control and transparency to global capital maintenance spend
- Supply chain cost reduction of 10 – 20%.
Batch Optimization

Client’s Challenge
Optimizing the batch production to achieve a cost reduction.

APPROACH
- Mass, energy and cost flow analyzes of plant (activity based costing)
- Identification of main cost drivers
- Identification of energy optimization potential
- Quantification of improvement potentials and feasibility assessment.

VALUE CREATED
- Cost transparency
- Overall reduction of costs for materials and energy of >20%
  - Reduction of costs for utilities and solvents
  - Reduction of disposal costs.
Product Improvement

Client’s Challenge
Optimizing production to realize a cost reduction.

APPROACH
• Mass, energy and cost flow analyzes of plant (activity based costing)
• Identification of main cost drivers
• Identification of energy optimization potential based on pinch analysis
• Quantification of improvement potentials and feasibility assessment.

VALUE CREATED
• Cost transparency
• Reduction of energy consumption
• Optimization of distillation processes.

Client
Confidential

Services
Energy Management
Process Optimization of Granulator Drying Process

Client’s Challenge
Realize a cost efficiency at the granulator drying process.

APPROACH
• Analyzes of production and energy consumption
• Energy balance including steam production
• Identification of energy saving potentials
• Quantification of saving potentials and feasibility assessment.

VALUE CREATED
• Cost savings achieved (20% of steam cost of process)
• Reduced energy consumption of process
• Improved steam production (use of waste heat)
• Improved understanding of drying process
• Cost transparency.
Thermal Control

Client’s Challenge
Optimize the HVAC system of a large production facility to achieve company targets of energy reduction.

APPROACH
- Dynamic energy balance for HVAC system
- Measurement of energy consumption
- Challenging of operation parameters
- / benchmarking
- Identification of optimization potentials
- Support of the implementation.

VALUE CREATED
- Energy savings achieved (heating and cooling)
- Definition of optimized set points.
Client’s Challenge
To meet global energy saving target of 5% reduction each year at each site until 2020.

APPRAoch
• Scope included feasibility, design development, construction and decommissioning of a new combined heat and power plant including creation of a power island and interface with existing site services
• Careful management of the challenging site logistics, encountering multiple unknown underground services, the need for a fully integrated contractor’s delivery / welfare area and the requirement for operational activities to go unchanged during construction within a cramped site footprint led to the need for careful planning and consultation for all aspects of the contractor’s approach.

VALUE CREATED
• Developed interface handover with engineering operations
• Delivering annual savings in the order of £1.2m per annum
• Reduced carbon emissions of 9,000 tons / per annum
• First ever CH&P plant for a multi national pharmaceutical company in the UK.
Chiller Optimization

Client’s Challenge

Improve energy efficiency of chiller system.

APPROACH

- Scope included feasibility, design development, construction and decommissioning of a new combined heat and power plant including creation of a power island and interface with existing site services
- Careful management of the challenging site logistics, encountering multiple unknown underground services, the need for a fully integrated contractor’s delivery / welfare area and the requirement for operational activities to go unchanged during construction within a cramped site footprint led to the need for careful planning and consultation for all aspects of the contractor’s approach.

VALUE CREATED

- Increase of chiller efficiency (COP from 2.9 to 4.2)
- Reduction of electricity consumption by >30%
- Improvement of cooling system (storage)
Energy and Water Assessments

Client’s Challenge
Fulfil its own energy and GHG emissions targets through 2015.

OPERATING

APPRAOCH
• Compliance check of site processes in accordance with the client energy management guidelines
• Clear overview of the most important suppliers and consumers and of major energy and water flows
• Identification of potential energy and water saving measures.

VALUE CREATED
• Conducted almost 20 assessments worldwide by end of 2013
• A substantial energy-saving potential was identified
• The assessments provide a clear overview of the energy and water consumption as well as of reduction potentials for sustainable cost savings.

Location
Global

Client
Confidential

Services
Energy & Water Management
Energy & Utilities Management at Three Large Production Sites in Switzerland

**Client’s Challenge**
Reduce operating costs to save money.

**Location**
Basel, Switzerland

**Client**
Confidential

**Services**
Energy & Water Management

**Value Created**
- Company and provider-independent consulting services
- Large cost savings achieved (energy, water, CO2 tax)
- Cost transparency.

**Approach**
- Energy data management (including monthly energy profile for each building and e-mail alarming for all buildings)
- Coordination of site energy teams composed of all companies on-site
- Energy saving programs, CO2 management, energy analyzes, energy challenging, etc.
- Support of energy provider.
Assuring Global Water Supply Quality

Client’s Challenge
Global initiative to verify water supplies were fit-for-purpose and legally compliant.

APPRAOCH
- Site data review and compilation, across 140 locations globally
- Advisory on regulatory water quality standards across multiple geographies
- Evaluation of treatment needs and decision tree
- Typical system examples / costs
- General equipment specification example.

VALUE CREATED
- Assisted with development of corporate standards for potable water
- Defined treatment interventions and decision-making
- Evaluated and created link-up with key supply chain and vendors.

Location
Global

Client
Confidential

Services
Water and Water Treatment Advisory
Reduction in Water Consumption at Two Production Sites

**Client’s Challenge**
Reduce water consumption as part of an effort to reduce overall water footprint and operating costs.

**Approach**
- Analysis and evaluation of the water consumption data per building
- Identification of water consumers with high saving potential
- Challenging of the water consumption and discharge of wastewater
- Measurement of consumption of large consumers
- Identification, implementation and evaluation of improvement measures to ensure continuous improvement.

**Value Created**
- Identification and implementation of measures saving a substantial amount of 24% wastewater per year
- Upgrading processes for water consumption and discharge wastewater to reduce operational cost.
M&A / TRANSACTIONALS
PROJECTS
Due Diligence Activities in Support of the ICI Acquisition

Client’s Challenge
Identify and address potential concerns and estimate reserve provisions for a large complex acquisition.

Approach
• Audits at more than 50 acquired sites, both active and legacy, where we identified and addressed potential concerns and estimated reserve provisions.

Value Created
• Estimated the provisions for ICI portfolio
• Centrally managed due diligence overall portfolio in a very cost effective way.

Location
Global

Client
AkzoNobel

Services
Due Diligence
Due Diligence to Create an Agrochemical Company

Client’s Challenge
Need for trusted-advisor to work with senior leadership at spin-off parent companies to identify and provision for global environmental matters.

APPROACH
Global auditing team mobilized to review and compile site-by-site assessments.
- Data room reviews in USA, UK and Switzerland, working directly with senior client teams
- Detailed site audits at key facilities around the world
- Provided follow-on due diligence advisory for selected sites.

VALUE CREATED
- Developed independent estimates of reserve provisions for 52 major manufacturing facilities around the world
- Created action plans for risk-and liability-reduction measures
- Advised on subsequent site portfolio synergies.

Location
Global

Client
Confidential

Services
Due Diligence
PRODUCT STEWARDSHIP
PROJECTS
Management of REACH Consortium

Client’s Challenge
Manufacturers and importers of the same family of chemicals substances can join force in a consortium under REACH for efficiency and financial reasons.

APPROACH
Since 2009, Arcadis is providing the overall management for several consortia under REACH, including:
- Advising the consortia on the registration strategy
- Handling business confidential information
- Preparation of registration dossiers
- Classification of the substances,
- Administrative and financial management of the consortia
- Follow up on the regulatory developments.

VALUE CREATED
- Cost saving
- Time saving, spreading the workload
- Outsourcing the preparation of non strategic dossiers
- Beneficiating from the Arcadis expertise.

Location
Europe

Client
Solvary

Services
Product Stewardship Services
Implementing the Authorization Regime Under REACH

Client’s Challenge
Preparation for authorization for Substances of Very High Concern (SVHC) in the context of the REACH regulation so that sites producing or using those chemicals in Europe and Switzerland can in order to guarantee a business continuity in the future.

APPRAOCH
• Identification and compilation of all uses of SVHC during research, development and production
• Proposing strategic options (Risk Management Options Analysis)
• Defining requirements for safe use
• Supporting the evaluation of alternatives
• Elaborating socio-economic analysis
• Accompanying our clients through the application process.

VALUE CREATED
• Awareness of the need for authorization at all sites
• Sites are prepared for authorization
• Business continuity is guaranteed for the future.

Location
EU & Switzerland

Client
Confidential

Services
Global Product Stewardship
Ecotox Testing

Client's Challenge

Lack of eco-toxicological data for substances, intermediates and production chemicals for classification, registration and risk assessment purposes.

Approach

- Laboratory testing in our own ecotoxicology laboratory in compliance with OECD’s Good Laboratory Practice (GLP)
  - Environmental fate (e.g. water solubility, log POW)
  - Biodegradability
  - Aquatic toxicity (algae, daphnia, fish, bacteria)

Value Created

- High quality data for classification & labelling as well as for safety data sheets
- Reliable data for a successful REACH registration
- Data for risk assessment purposes.

Location
EU & Switzerland

Client
Confidential

Services
Global Product Stewardship
Keeping Key Agrochemical Products in the Marketplace

**Client’s Challenge**

Largest environmental product stewardship sampling program ever performed across Europe, to assist major product re-registration initiative.

**Services**

Product Stewardship, Environmental Services, Data Management, Quality Assurance

**Location**

Europe

**Client**

Confidential

**APPRAOCH**

- Strategic advisory and planning with client for over a year to develop optimum operational and business approach
- Used Arcadis in-house drilling capability and our geographic resources across Europe to provide seamless delivery
- High-quality site assessment works using team of 150 staff
- Flexible team-management to ensure program and geographic challenges were met.

**VALUE CREATED**

- Provided leading-edge groundwater testing at 125 farms across 11 countries
- Interviewed 5,000 farmers, creating key user knowledge
- Standardized protocols across Europe gave consistency & reliability of data
- Developed a bespoke web portal as a data hub to manage and interpret complex information flow.
COMPLIANCE / REGULATORY DRIVEN PROJECTS
Remediation of Residential Area

Client’s Challenge
Remediate contaminated soil and groundwater located under a residential and commercial area.

Location
Vilvoorde, Belgium

Client
AkzoNobel

Services
Environmental Remediation

REDEFINING

APPRAOCH
• A pilot study of the remediation approach was first conducted and then a full scale of the in-situ remediation remedy using a combination of chemical oxidation and stimulation of biological decomposition was implemented.

VALUE CREATED
• Removed exposure risk to residents by remediating the soil and groundwater to regulatory standards
• New redevelopment opportunities for the site are being considered.
Remediation of Wolverhampton Legacy Site

Client’s Challenge
A former production site was turned into a residential area with an existing environmental impact. Client needed to minimize risk for the residents and protect their sustainability and brand reputation.

Location
United Kingdom

Client
AkzoNobel

Services
CS2 In-situ Remediation

REDEFINING

APPRAOCH
- Pilot testing and full-scale implementation of new innovative techniques to lower environmental liability of a residential area in former production site in the UK
- Arcadis was awarded the 2011 Brownfield Briefing Award for best in-situ treatment.

VALUE CREATED
- Reduced environmental liability from €30m | €10m (savings of €20m)
- More sustainable remediation solution
- Supported negotiations and communications with regulatory authorities and local residents
- Overall project management.
Ensuring Compliance with Health Standards

Client’s Challenge
Confirm compatibility of Environmental Health Quality with the procedures implemented on the site.

APPRAOCH
• Collected and analyzed ambient air samples of the work atmosphere and performed a quantitative evaluation of health risks.

VALUE CREATED
• A management plan to implement additional actions required to ensure proper air quality at the site.

Location
France

Client
Arkema

Services
Human Health and Ecological Risk Assessments,
Site Investigation And Remediation
Creating Project Synergy Between Remediation and Reconstruction Activities

Client’s Challenge
Confirm compatibility of Environmental Health Quality with the procedures implemented on the site.

APPRAOCH
- Investigation on contaminants in the office building
- Develop concepts for remediation and H&S plan, tender documents
- Supervision of remediation during reconstruction of the building including H&S.

VALUE CREATED
- Investigation under office operation, combining remediation and reconstruction, high demands on H&S and security for workers, BASF operations and traffic inside and outside BASF site.

Location
Ludwigshafen, Germany

Client
BASF

Services
Asbestos and PCB Removal,
Reconstruction Services
Deconstructing Complex Environmental Liabilities into a Manageable Site Strategy

Client’s Challenge

Address multiple issues with soil and groundwater quality at multiple areas of an acquired facility currently participating in state voluntary program and consult on SWPPP compliance.

Location
Kankakee, Illinois

Client
BASF

Services
Site Characterization, Remediation, SWPPP, Permitting Assistance

APPRAOCH

• Site-wide strategic evaluation of contamination issues including assessments of value in continuing pre-acquisition interim remediation activities and participation in state voluntary program.
• Further characterization to optimize remediation cost effectiveness
• Coordination with plant regarding development plans and concerns for worker health and safety.

VALUE CREATED

• Refined characterization of PCB in soils to prepare more cost-effective remediation plan. Initiated GIS and 3-D visualization of impacts for improved evaluation and costing.
• Evaluated on-going P&T effectiveness through rebound assessment; identified potential areas of surcharge from process sewer leaks; discontinued P&T in one area
• Coordinated with plant to consolidate and optimize remediation of PCBs in soil and VOCs in soil and groundwater.
Providing a Remediation Strategy to Realize the Full Retail Potential for the Site

Client’s Challenge

A holistic and comprehensive remediation strategy for the entire site. Site has 100 years of industrial activity and is an active production site. Multiple areas of concern under joint orders from State and U.S. EPA for remediation.

Location
North Works, Wyandotte, Michigan

Client
BASF

Services
Site Investigation and Remediation

Approach

- Proposed remediation that looks at a site wide risk management strategy and compliance with regulatory criteria at the site boundary.
- Exploring use of innovative in-situ technologies to improve cost-efficiency and provide creative / cost-acceptable solutions for groundwater treatment for the complex site conditions and groundwater geochemistry at this site.

Value Created

- The risk-based approach and perimeter management strategy will result in significant cost savings for BASF while still being protective of human health and the environment.
- The North Works site is viewed as a “growth” site and the holistic view of the project execution will allow for future investment projects at the production site.
Trusted Partner in Addressing Soil / Sediment Related Environmental Liabilities

Client’s Challenge
Managing environmental liabilities associated with production operations in and around Antwerp Harbour.

APPRECH
• Performing a wide range of environmental impact assessments and investigations to properly identify existing and potential liabilities associated with environmental impacts to the soil / sediment in the harbor of Antwerp associated with the client’s production activities.

VALUE CREATED
• Supported and defended the client’s interests by giving strategic advice on liabilities and potential liabilities
• Remediation scenarios and sound cost estimates appropriate for business decisions
• Facilitated communication with local legislation and government agencies to support activities and avoid lengthy regulatory delays.

Location
Antwerp, Belgium

Client
Bayer

Services
Soil Consultancy
Guidance on Biodiversity and Ecosystem Services

Client’s Challenge
Awareness raising of CEFIC members on biodiversity and ecosystem services.

Location
Brussels, Belgium

Client
Cefic

Services
Biodiversity

PLANNING

APPROACH
• Interactive approach based on intensive preparatory desk study work, completed by chemical sector input by frequent steering group meetings and CEFIC members workshop.

VALUE CREATED
• Clear insight in chemical industries’ impacts and dependencies on biodiversity and ecosystem services
• Clear insight in biodiversity related risks and opportunities, raised by degraded ecosystems, evolving regulatory framework, and changing stakeholder expectations.
Remediation of Chlorinated Solvents Contamination without Impact on Production

Client’s Challenge
High concentrations of PCE, TCE, DEC and VC in the groundwater under an active facility.

Location
Lokeren, Belgium

Client
Eastman

Services
Groundwater Modelling – Hydrogeology And Geochemistry, In-situ Remediation, Program Management

VALUE CREATED
• Rapid biological degradation is observed in the plume zone and remediation has been completed in parts of the plume
• Remediation is on track to be finished after five years.

OPERATING

 APPROACH
• The original pump and treat strategy was combined with an enhanced reductive de- chlorination with injection of molasses and a down-gradient pumping barrier (four ERD- barriers perpendicular to the groundwater flow) to achieve the remediation goals for the different contaminants (PCE,TCE, DCE, VC and a minor BTEX) while minimizing site disruption.
Guiding the Identification of Exposure to Hazardous Substances for a Client in the Flavor and Fragrances Industry

Client’s Challenge
Conduct a legally required assessment of exposure of employees to hazardous substances.

Approach
- Assessing possible exposure times and available data
- Being a sparring partner for the EHS staff of Givaudan for choices in substances and worst-case exposure scenarios
- Measuring and analyzing the exposure of hazardous substances
- Consulting on the determination of the exposure limit of products.

Value Created
- Successful collaboration with the EHS staff of the Client on both the requested measuring activities as well as the development of a Strategy around the emission of hazardous substances in the production processes.
- Developed a plan to implement hygiene measuring activities according the local standards and regulations.
Trusted Partner in Strategic, Investigation and Technical Soil and Archaeological Services on Site

Client’s Challenge
Address multiple challenges with contaminated soil and groundwater for new build assets, remediation projects and safety requirements.

Location
Tilburg, the Netherlands

Client
International Flavors & Fragrances (IFF)

Services
Site Investigation and Environmental Remediation, Technical Investigation of Contaminants in Soil and Groundwater

APPROACH
• As of 1988 Arcadis is involved in the site investigations of comprehensive contaminations in soil of BTEX (benzene, toluene, ethylbenzene and xylenen) and organic chlorinated hydrocarbons. Pump and treat is used to control and remediate the contaminants in the groundwater.
• All site investigations of contaminations in soil necessarily for new build assets, remediation and safety requirements.
• For new build assets, Arcadis provides the standard required archaeological research and gives IFF advice in their communication towards the local authorities.

VALUE CREATED
• Based on years of historical on-site experience as single sourced supplier, Arcadis collected a significant amount of site and monitoring data. Therefore, Arcadis is ideally placed to perform new site investigations, archaeological research, remediation and recommendations about the future developments.
• Intensive successful collaboration with the IFF employees for many years.
• Facilitated communication with local authorities and government agencies to support activities and avoid lengthy regulatory delays.
Support Hazardous Substances ARIE - Regulation

Client’s Challenge

PFW Aroma is a company under Seveso Legislation and falls within the Dutch ARIE - regulation on occupational health and safety legislation. This legislation is focused on protecting employees against severe incidents with hazardous substances. The Dutch Inspection Authority for Labor had performed a compliance audit. As a result of the audit several findings of noncompliance were indicated. The Authorities urgently requested PFW Aroma to solve these findings as soon as possible, to implement a documented procedure within the safety management system to keep the scenarios up to date when regulation changes.

OPERATING

Location
Tilburg, The Netherlands

Client
Keva

Services
Occupational Health and Safety Services

APPRAOCHE

• Arcadis being on the production facility for this project allowed the experts from PFW Aroma and Arcadis to discuss the different scenario’s in very efficient way and, if needed, use of the expertise of the Arcadis back office for special niche -expertise. This way the scenarios, studies, drawings were easily combined with the factual situation on location.

• Arcadis analyzed all the ARIE scenarios separately, considering consistency with past safety studies, the factual technical status and an objective, independently judgement if a minor or extended actualization of the scenarios was needed.

• Interactions with the Authorities were also very important in the process to resolve the noncompliance issues, in which Arcadis supported PFW.

VALUE CREATED

• The best results were made due to a very intensive and personal collaboration between PFW and Arcadis.

• The noncompliance issues on occupational health and safety legislation were solved conform satisfaction of both PFW and the Dutch Inspection Authority for Labor.
Enable Our Client’s Products in the Chinese Market

Client’s Challenge
To ship products into and out of China local regulatory applications must be applied correctly.

Location
China

Client
Confidential

Services
Product Stewardship Services

OPERATING

PLANNING

APPRAOCH
• Prepared the Chinese regulatory applications in Chinese
• Reviewed the applications with Chinese authorities
• Provided guidance to our client regarding registration processes, safety data sheets and labels in accordance with applicable requirements.

VALUE CREATED
• Enabled our client’s products to be shipped to and sold in China
• Reduced handling costs by facilitating customs clearance
• Client’s business in China has more than tripled since 2012.
Helping a Pharmaceutical Company Reduce Environmental Liability Safely and Cost-Effectively across the U.S.

Client’s Challenge
Cost effectively address environmental liabilities associated with their U.S. asset portfolio

APPRAOCH
- Provide 'big picture' consulting, sound technical advice and innovative investigation and design technologies for soil and groundwater remediation.

VALUE CREATED
- Providing assurance through compliance with local, state and federal regulators
- 'Green light' to proceed with transactions by sufficiently addressing environmental liabilities
- Managing multiple projects across the U.S., giving the client the peace of mind that their core assets are remediated safely and cost-effectively, reducing risk and protecting their investments.
Client's Challenge
Proper off-site disposal of PFOS-contaminated topsoil.

**Value Created**
- Elimination of a liability
- Staying in compliance with upcoming regulations
- Cost-effectiveness.

**Approach**
- Scan for feasible, licensable and cost-effective disposal options
- Declaration of the soil material according to German law and state guidelines
- Request for proposals to different disposal companies
- Assessment of the proposals and support in decision making
- Finally, management of the disposal activities.

**Location**
Germany

**Client**
Confidential

**Services**
Environmental Waste Management
Upgrading Water Facilities to Meet New Standards

Client’s Challenge

Achieve greater than 95% reduction of ammonia and nitrate in wastewater effluent.

LOCATION

Attapulgus, Georgia

CLIENT

Confidential

SERVICES

Wastewater Design, Treatability and Permitting Assistance

OPERATING

VALUE CREATED

• On-site pilot testing of biological treatment allows identification of potential issues and determination if effluent will meet new, more stringent limits without further treatment
• On-site pilot testing will experimentally determine design factors to potentially reduce design conservatism on a $12m wastewater treatment plant upgrade
• Review and comment on highly politically charged permit renewal and TMDL development.

APPROACH

• Evaluation of nitrogen compounds sources, treatment technologies and reuse opportunities; pilot testing of selected biological treatment technology and design of treatment system (future).
Client’s Challenge
Develop proactive global plan to manage and prioritize remediation efforts at 20 facilities worldwide.

APPROACH
• Develop simple environmental information questionnaire to frame baseline assessment of conditions
• Inventory and rank site risks according to the client environmental management program
• Develop tracking program for at-a-glance summary.

VALUE CREATED
• Identified opportunities for potential cost savings through application of remediation technologies
• Coordinated 3-year plan to prioritize remediation efforts according to the client division business plan.
Identifying and Addressing Environmental Liabilities

Client’s Challenge

Identifying and addressing environmental liabilities prior to development activities (remodelling, use change, or D4) at production facilities across Europe.

Approach

• Completed phase I / II investigations & assessments of buildings or production facilities as well as remediation activities in accordance with international and national standards.

Value Created

• Equipped client decision-makers with complete and accurate environmental assessment data in order to proceed with development plans
• Developed cost-effective mitigation measures, etc.

Location
Switzerland, France, Italy

Client
Confidential

Services
Environmental Investigation / Remediation
On-time and Under-budget Brownfield Clean-up

Client’s Challenge
Intervene on a problematic contaminated land remediation project to enable imminent plant expansion.

APPRAOCH
• Arcadis coached a competitor & various subcontractors, reassessed the remediation strategy, and were instrumental in delivering this project on-time and significantly under budget.
• Our approach was to surgically target hotspots, combined with intelligent use of on-site validation tools and techniques.
• We also ensured compliance with regulators and internal controls to avoid long-term liabilities.

VALUE CREATED
• Project brought back on- schedule by collaboration and one-team approach
• 2 months prior delay recovered
• Remediation delivered swiftly, enabling the new-build program to start as planned
• No additional cost for treatment of groundwater remediation following risk review
• 37% cost saving realized as a result of technical know-how and diligent cost and program management.
Release Response and Compliance Support

Client’s Challenge
Chemical release occurred prompting regulatory notice of violation.

Location
Vacaville, CA

Client
Confidential

Services
Risk Assessment, Feasibility Studies

APPROACH
• Conducted evaluation of release and provided support in responding to agency inquiry. On-going support to develop long-term compliance program.

VALUE CREATED
• Simplified a complex problem to a manageable solution in a turbulent political environment
• Regulatory negotiations minimized fines and established trust with regulators
• Developed proactive, long-term compliance strategy to match business cycle planning.
Navigating a Socio-Political Challenging Climate while Reducing Environmental Liability

Client’s Challenge
Cost effective and socio-political friendly approach to addressing environmental liability.

Location
Bonfol, Switzerland

Client
Confidential, Roche, BASF, Clariant

Services
Risk Assessment, Feasibility Studies

APPROACH
• Conducted risk assessment, feasibility studies, planning of remedial project, elaboration and evaluation of tenders for an excavation / incineration solution. General support during execution phase for the €300m project.

VALUE CREATED
• Simplified a complex problem to a manageable solution in a turbulent political environment
• Controlled socio-political emotions by application of a strictly technical and scientific approach
• The sound, risk-based, approach applied prevented disproportionate remediation costs.
Helping to Manage Environmental Liability of Major Chemical Production Site

Client’s Challenge
A holistic and comprehensive remediation strategy for the entire site.

Location
Monthey, Switzerland

Client
Confidential, BASF, CIMO

Services
Site Investigation and Remediation

OPERATING

Approach
More than 30 projects at the chemical production site of Monthey (Switzerland) have been implemented during the past decade. These projects include investigation and remediation activities at various sub-sites within and outside the site.

VALUE CREATED
• The projects have successfully been realized, despite strong regulatory pressure
• The sound, risk-based approach applied for each project has prevented disproportionate remediation costs
• The holistic view of the project execution has allowed to extend the client’s freedom of action for future investment projects at the chemical site.
Actualization of Safety Report BRZO 2016

Client’s Challenge

Every company which is labelled as an BRZO company (Besluit Risico Zware Ongevallen), or Dutch Major Accidents Decree is obligated to overhaul their Safety Reports Every 5 years, to ensure that all policies, procedures and processes are aligned and up to date and communicated to the authorities. This means indicates that a safe working environment is in place and the organization is compliant.

Updating the safety reports is a challenge because it demands a thorough analysis of the organization and processes and expertise about Dutch regulations and procedures.

APPROACH

• Arcadis was appoint this assignment because of its proven track record in safety management and BRZO related matters.
• The team of Arcadis Advisors were capable of using their in depth knowledge and project management skills to finalizing the report within budget and time constraints, upon client satisfaction.
• The client was kept up to date about the process, and the in depth (regulatory) changes that are made in the reports.

VALUE CREATED

• Compliance with the BRZO standards & Safe working environment is in place
• In budget and with cost savings for the clients who could focus on their core processes.

Location
Tilburg, The Netherlands

Client
International Flavors & Fragrances

Services
Health & Safety Management, Project Management
Quick Scans Real Estate Valuation

Client’s Challenge
Redevelopment of manufacturing facilities in several countries for mixed use.

Location
17 global locations

Client
AkzoNobel

Services
Quick Scans Real Estate Valuation

REDEFINING

APPRAOCH
• Multiple development programs with NPV calculations, redevelopment scenarios, site investigation, cost evaluation, design, planning & approval.

VALUE CREATED
• Strategic closure strategy based on potential NPV
• Minimizing environmental liability related to NPV and future use
• Creating a stronger negotiation position for client to capture redevelopment value.
Creating Suitable Real Estate for Commercial Redevelopment

Client’s Challenge
Deactivation, decommissioning, decontamination and demolition (D4) of buildings, plants and equipment at the Grenzach site for redevelopment as industrial area.

APPROACH
• Investigation on contaminants in buildings and plants, concepts for remediation and D4, H&S plan, tender documents and supervision of D4 including waste management, time hunting and H&S.

VALUE CREATED
• Complex D4 project in budget and schedule to create a future industrial area.

Location
Grenzach, Germany

Client
BASF

Services
D4
Shaping Regulatory Change to Facilitate Legacy Site Closure

Client’s Challenge

Project site was under regulatory consent judgment to submit interim response design to meet criteria document (closure plan) or risk stipulated penalties. 30 million dollars had already been spent on interim remedy (total containment system). Residual impacts associated with 3rd parties.

Location
Riverview, Wyandotte, Michigan

Client
BASF

Services
Site Investigation / Remediation And Regulatory Support / Advocacy

Redefining

Value Created

• Saved client approximately two (2) to three (3)m dollars in presumptive remedial costs and complied with all requirements of the consent judgment without further work being required.

Approach

• Arcadis has had an active advocacy program to redefine some key statues in Michigan’s regulatory program
• Successfully changed the rules and applied the changes to this site. Project was the first project in Michigan to submit a request for a de minimus determination and first to receive approval from the State.
Strategic and Technical Services to Support Land Sales at a Redundant Production and R&D Facility

Client’s Challenge
Sequential regeneration and sell-off of redundant footprints following the closure of a chemical production and research & development facility in Switzerland.

APPRAOCH
Arcadis BMG provided overall project management, including:
• divestment strategy consultancy
• detailed site investigation
• management of different remediation projects
• facility demolition management
• advisory to support a sequential series of land sales.

VALUE CREATED
• Supported negotiations and communications with regulatory authorities
• Our risk communication significantly assisted the successful sale of the R&D footprint of the facility
• Provided assurance to potential investors that residential re-use was viable for some land parcels
• Sustainable remediation based on cost / benefit principles and the motto “how clean is clean enough?”

Client
Confidential

Services
Site Divestment Consultancy, Remediation & Risk Management, Demolition

© Arcadis 2015
Decommissioning of Wastewater Treatment Plant

Client’s Challenge

Optimized decommissioning of treatment plant combined with complete remediation to be executed within tight time frame and optimized costs.

Approach

- Decommissioning & dismantling of the wastewater treatment plant and HCH rehabilitation within the site and surroundings
- Arcadis was appointed as a member of the Steering Committee to oversee the key environmental & remediation issues of this €100 million project.

Value Created

- Value created through assurance that the stringent corporate environmental & sustainability guidelines of the client are followed and met
- Clean-up levels for a future greenfield area defined in accordance with corporate guidelines preventing long term disproportionate remediation costs.

Location

France, Italy

Client

Confidential

Services

Advise on Environmental and Remediation Issues to Steering Committee
A Sustainable Remediation in the City

Client’s Challenge
An Italian Multi National company needed to demolish and redefine their former plant, which was challenging as it was in a central city location and sustainable solutions were required.

APPROACH
• Arcadis was engaged to provide decommissioning and remediation executive design and services to demolish and reclaim the former plant. The challenge was for Arcadis to complete the project within the three-year timescale, using sustainable methods and ensuring minimal impact on the surrounding urban area.
• Arcadis adopted innovative technologies like thermal desorption, In Situ Chemical Oxidation (ISCO) and Multi Phase Extraction (MPE) to achieve the right outcome for the client.

VALUE CREATED
• Complex D4 and remediation project on time and within budget to return an important area to the citizens and to create a future residential area/zone
• Low impact to the surrounding area.

Location
Italy

Client
Italian Multinational Company

Services
Environmental Restoration (former ECS) and D4